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THE JOURNAL OF APPLIED PSYCHOLOGY

JAMES P. PORTER, *Editor*
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With a Board of Cooperating Editors

SOME INTERESTING CONTRIBUTIONS IN THIS ISSUE:

RENSIS LIKERT. A Method for Measuring the Sales Influence of a Radio Program.

DANIEL STARCH. An Evaluation of Principles of Behavior.

H. P. LONGSTAFF. Effectiveness of Children's Radio Programs.

GRAHAM B. DIMMICK. Differential Interests of Engineering Graduates.

JEANNE G. GILBERT. Senescent Efficiency and Employability.

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A METHOD FOR MEASURING THE SALES INFLUENCE OF A RADIO PROGRAM

RENSIS LIKERT
New York University

WE HAVE lost sight of our primary purpose for measuring radio programs. What we really want to know is not how many persons are listening to a program or can identify the sponsor; the real information that we desire is just how much influence the program in question is exerting on sales. Our only purpose in determining the number of persons who listen to a program and the number of persons who can identify the sponsor is to use the information as indirect measures of the sales influence.

It is obvious that if people do not listen to a program, the commercial announcements made during the program can have no influence upon them. Consequently, if a program has a very small audience, we have evidence that its sales influence must also be relatively slight. In this way knowledge of the size of a program's audience frequently gives us a *negative* measure of the sales influence of the program. However, knowing that a program has a large listening audience does not tell us that its *sales influence* is correspondingly large.

Essentially the same situation exists with respect to knowing the proportion of the radio public who can identify the sponsor of the program. If we know that only a small proportion of the regular audience can identify the sponsor, it tells us that the advertising message has not made a sufficient impression to register the sponsor. On the other hand, if we know that a large proportion can identify the sponsor, that is *all* we know. We do not know whether the announcements have impressed people in such a way that they will buy or whether the commercials have so antagonized people that they

will avoid buying the product advertised. Thus, the commercial announcements in some programs are so prominent that these programs cannot help having a high degree of sponsor identification. There is evidence, however, that while the public is aware of the product advertised by these programs, many individuals are reacting unfavorably to the advertising announcements.

Actual sales are sometimes used as a measure of the influence of a radio program. Sales reflect, however, not only the effect of the radio program in question but the influence of *all other factors* as well, such as price changes, all other advertising of the product, competitive advertising, changes in the product or competitive products, and changes in distribution of the product or competitive products. Consequently, changes in sales cannot safely be attributed to the influence of any *one* factor, and therefore, can be used only as a very rough approximation of the sales effectiveness of a radio program. Other disadvantages are: that accurate sales data are frequently difficult and expensive to obtain or they are obtained only after the lapse of so much time that their value as a measure is greatly reduced.

In buying radio time you do not buy so much coverage or so many sets. All that is purchased is *potential* coverage. The actual coverage obtained will depend on the entertainment value of the radio program and its relationship to the radio listening habits of those persons it seeks to reach. The nature and extent of a magazine's circulation is a measure of the *opportunity* that it gives to present your advertising message to the group whose buying habits you wish to influence; similarly, the number and character of those listening to your radio program gives you a corresponding measure of the advertising opportunity that is available to you. ***But it does not tell you how well you are availing yourself of this opportunity.***

In the case of any radio program we need a second measure to tell how well it is utilizing the advertising oppor-

tunity presented by the group of listeners that the entertainment part of the program attracts. This second measure will show the influence exerted by the advertising message upon the buying habits of those who are listening to the program. That is, the net advertising influence of a radio program is a function of two factors. It depends upon (a) how many persons listen to the program and (b) the influence that the advertising message has on those who listen.

These two measures which are required to determine the sales influence of a radio program can be computed if we proceed in the following manner:

1. We must determine the proportion of the total population who listen to the radio program whose sales influence we desire to measure. This material should be analyzed to show the character of the listening audience—in terms of age, economic status, sex, geographical location, etc., as well as its total size.
2. It is necessary to determine for those listening to the program in question, the proportion who buy the product. The group used for determining this proportion should be a representative sample of those who listen to the radio program.
3. Finally, we must determine for those who do not listen to the program the proportion who buy the product. It is essential that the group used for determining the proportion of those who use the product but do not listen to the program be comparable in every way (except that they do not listen to the program) to the group used in determining the proportion mentioned in 2.

The data secured in number 1 above is, of course, the first measure that we need. It tells us the size and character of the audience listening to our program.

The method of analyzing the data secured in steps 2 and 3 which will give us the second measure that we require, namely, the effect of the program upon those who listen, is based upon a relatively simple concept. We know the proportion of the population who use the product and are not subject to the

TABLE I

A Comparison of the Various Methods of Measuring Radio Programs

COLUMN I	COLUMN II	COLUMN III	COLUMN IV	COLUMN V	COLUMN VI (II × V)	COLUMN VII	COLUMN VIII	COLUMN IX		
	Percentage Listening	Percentage of Listeners that Buy	Percentage of Non-Listeners that Buy	Difference: Additional Users in Every 100 Listeners	No. of Additional Users Secured by Radio Program for Every 100 Possible Consumers	Percentage Correctly Identifying Sponsor—All Interviews	Proportion of Total Users Secured by Radio Program Per cent	Percentage Considering Program:		
								Excellent	Fair	Poor
Program A ..	80.3	14.2	7.4	6.8	5.46	57.8	42	73.1	24.8	2.1
Program B ..	80.5	9.7	7.4	2.3	1.85	48.6	20	64.1	32.2	3.7
Program C ..	45.0	2.5	1.5	1.0	0.45	25.3	23	62.5	32.0	5.5
Program D ..	70.4	12.6	8.6	4.0	2.82	70.2	25	27.1	49.8	23.1
Program E ..	53.1	6.5	4.4	2.1	1.12	12.0	20	.....	.....	.....
Program F ..	60.1	21.4	12.2	9.2	5.53	44.1	31	.....	.....	.....

influence of the radio program. We also know the proportion of users among another group who are similar to the first group in all respects *except that they listen to the radio program being studied.* The factors of distribution, price changes, competition, newspaper and magazine advertising, etc., are acting similarly on the two groups. Consequently, any difference between the groups in purchasing habits can be attributed to the only difference between them, namely, the influence of the radio program.

To illustrate this method we might apply it to data from recent surveys. Programs A to D, inclusive, advertise the same kind of product, which we will call a food product here. Program E advertises another kind of commodity and Program F advertises a third type. The data in Table 1 for each program apply only, of course, to the area covered by that program.

The second column in Table 1 shows the percentage listening to each program. This of course, tells us the size of the listening audience and is the first of the two measures that we require to evaluate a radio program.

If we examine Table 1, we will observe that of those listening to Program A, 14.2 per cent buy Brand A. On the other hand, among those not listening to Program A only 7.4 per cent buy Brand A. That is, among the listeners to Program A there are 14.2 per cent that buy Brand A, or 6.8 per cent more than the 7.4 per cent of Brand A buyers among the non-listeners. If these two groups are essentially comparable, except for the habit of listening to Program A, then this increase in the purchasing of Brand A among the listeners can be attributed to the influence of the total advertising content of Program A. In other words, among every 100 consumers listening to Program A we should expect 7.4 persons to buy Brand A because of the influence of all the sales and advertising efforts other than radio. Actually, 14.2 buy Brand A. This difference or increase of 6.8 users among every 100 listeners can be considered as business secured over

and above what would be obtained without the radio program and can therefore be attributed to the radio program. The same data for each program are shown in Table 1.

The two measures, (a) the percentage listening and (b) the difference value, can be combined for each program into a single index which will show the net advertising value of the program. For Program A, the difference value as stated above, is 6.8. In other words, among those listening to it, Program A secures an additional 6.8 users of Brand A for every 100 listeners. If we multiply this 6.8 (the increase in Brand A users among those listening to Program A) by the 80.3 per cent who listen to Program A, we obtain 5.46 which is the value for Program A of the index combining both measures. Actually this value (5.46) shows the number of additional users of Brand A secured by Program A for every 100 consumers. That is, for every 100 persons who are actual or potential users of Brand A or any other brand in the area covered by the program there are 5.46 more users of Brand A than there would be without the influence of this radio program. This combined index or sales influence index can be computed for each program and is shown in Column VI, Table 1.

In the case of Program C the sales influence index shown in Column VI is somewhat lower than the actual sales influence exerted by the program. This program has coverage in many areas where Brand C has poor distribution. Brand C is strongest in the South where it is used by 2.9 per cent of all consumers. Presumably it would have its best distribution there. The difference value for Program C for the South is 1.6, its audience is 46.1 per cent. Consequently, its total sales influence is 0.74. That is, in the section where Brand C has its best distribution the computed difference value is one and one-half times as great as for the total area covered by the program. Furthermore, since the size of the audience remains essentially the same, its computed total sales influence is also one and one-half times greater in the area where it has good distribution than for the total area.

These results indicate that the sales influence of Program C is not being realized because of poor distribution. Moreover, it is evident that to obtain an accurate picture, the difference value and the total sales influence for any program should be computed only for the area where the product has good distribution. It will be observed also that this method can be used to determine whether the distribution in any area is sufficient to obtain the maximum return from advertising expenditures.

Column VII of Table 1 shows the percentage of respondents that correctly identify the sponsor. In Column IX the opinion of the respondents concerning the first four programs is given.

The data which are presented in Table 1 give us an opportunity to make a tentative evaluation of some of the common methods of measuring radio programs. This evaluation may be briefly summarized as follows:

1. None of the currently used methods for evaluating a radio program give an accurate picture of the sales influence of a program.
   (a) Size of listening audience, the measure used in the Cooperative Analysis of Broadcasting ratings, is quite misleading. Program A with the same size audience as Program B (80.3 per cent and 80.5 per cent respectively) is actually three times more effective in the sales influence exerted. Program D, with a somewhat smaller audience than Program B, has an appreciably greater sales influence. Program F with an audience smaller than that of most of the other programs is the most effective of all in sales influence.
   (b) Sponsor identification is also misleading. Program D, with a higher sponsor identification than Program A or Program F, has a sales influence of only about one-half that of either of these programs. Although Program B has a sponsor identification slightly higher than that of Program F, it is, how-

ever, only one-third as effective in the sales influence that it exerts.

(c) The percentage considering a program excellent is also an unsatisfactory measure of the sales influence of a program. Program D with only 27.1 per cent considering it excellent is actually second (among Programs A to D) in sales influence. Program C which is only slightly lower than Program A and Program B in the proportion considering it excellent has a sales influence very much smaller than either of these programs.

2. To accurately measure the effectiveness of a radio program, we should determine not only the nature and size of the listening audience but also the effect of the program upon the buying habits of that audience. These two measures will permit us to compute the sales influence of a program and also to determine what part of a program needs strengthening in order to obtain the maximum sales influence.

Of all the persons using a particular brand, the proportion which has been secured by the radio program can be computed and is shown in Column VIII. This proportion is obtained by dividing the number of additional users secured by the radio by the total number of users. That is, for the data in Table 1, this proportion for each program can be obtained by dividing Column VI by the sum of Column VI and Column IV. As will be recognized this proportion permits a sponsor to determine approximately whether or not his radio program is a profitable venture.

AN EVALUATION OF PRINCIPLES OF BEHAVIOR

DANIEL STARCH
New York City

THE purpose of this inquiry was to determine (1) what principles or rules of conduct are found to be of practical value in everyday living and (2) what the relative value of such principles or rules may be. Some incidental consideration was also given to the question as to the psychological foundation for or support of such principles.

The study was undertaken in the first instance by ascertaining from approximately 50 men and women in various occupations and social and economic levels what, if any, were the rules, maxims, or statements which they found of practical value in guiding conduct. In this manner approximately 300 statements, maxims, or quotations were secured. These statements were then examined by three persons, including the writer, for the purpose of eliminating the less important statements and compiling a selected list of the more valuable ones. This process of elimination resulted in a list of 96 statements. These 96 statements were then printed in miscellaneous order and numbered from 1 to 96.

The evaluations and selections of the more valuable statements among the 96 were made by 600 persons according to the following instructions:

"The following is a series of maxims or rules of conduct selected from a much larger list. Will you kindly check the most valuable ones, say about 25, and of these double check about 5 that are most important of all? Please add at the end any which are not included in this list, but which in your opinion are really valuable."

The 600 persons, 291 men and 309 women, were composed of a general group of 110 individuals, 57 men and 53 women,

representing a wide cross-section of the general population, such as business executives, clerks, stenographers, professional persons, and housewives; 31 psychologists, 16 men and 15 women; 10 ministers, men; 8 distinguished philosophers, men; 51 college students, 30 men and 21 women; 65 unclassified persons, 34 men and 31 women; and 325 teachers, principals, and superintendents of schools, 136 men and 189 women who were attending summer session courses at various large universities. The results of these groups in the main agreed so closely with one another and with the original general group of 110 persons that they are all combined here into one set of figures. Such differences as existed between the groups will be pointed out without giving the full tabulation for each group separately.*

The choices obtained from the 600 persons were then compiled by giving one point to each single check and five points to each double check. The results are shown in the following table which gives the final rank, the original number assigned to each statement, and the preference score for each of the 96 statements. The lists used by the 600 persons did not, of course, contain authors or sources of the statements.

RANK	ORIG. NO.		PREFERENCE SCORE
1.	(49)	Do unto others as you would that they should do unto you. (The Bible)	1237
2.	(7)	Know thyself. (Socrates)	1125
3.	(9)	Anything that is worth doing at all is worth doing well	744
4.	(3)	If at first you don't succeed, try, try again. (William E. Hickson)	719
5.	(83)	The great essentials of happiness are something to do, something to love and something to hope for. (Chalmers)	697
6.	(84)	The only way to have a friend is to be one	637
7.	(12)	As a man thinketh in his heart, so is he. (The Bible)	615

* I want to express my appreciation of the time and thought given to making these selections by the 600 persons who cooperated with me.

RANK	ORIG. NO.		PREFERENCE SCORE
8.	(42)	Knowledge is power. (Hobbes)	615
9.	(57)	Actions speak louder than words	579
10.	(26)	An ounce of prevention is worth a pound of cure	564
11.	(95)	If you can't say good about people, say nothing	562
12.	(29)	Life is what you make it. (Marcus Aurelius)	548
13.	(52)	It is important to act, it is more important to think, but the most important thing of all is to think and act. (Daniel Starch)	533
14.	(55)	Be calm and self-possessed, know what you are about, be sure you are right, then go ahead and don't be afraid. (Daniel Starch)	509
15.	(48)	This above all: to thine own self be true, And it must follow, as the night the day, Thou canst not then be false to any man. (Shakespeare)	470
16.	(96)	True worth is in being, not seeming	456
17.	(22)	Live and let live	436
18.	(19)	To err is human; to forgive divine. (Pope)	433
19.	(74)	The only way in which one human being can properly attempt to influence another is by encouraging him to think for himself. (Leslie Stephen)	414
20.	(43)	A good way to relieve the monotony of any job is to think up ways of improving it	405
21.	(70)	Give to the world the best that you have and the best will come back to you	386
22.	(16)	Self-trust is the first secret of success. (Emerson)	373
23.	(47)	Man does not live by bread alone. (The Bible)	361
24.	(51)	Where there is no vision, the people perish. (The Bible)	356
25.	(73)	A man's real limitations are not the things he wants to do but cannot; they are the things he ought to do but does not	343
26.	(46)	Judge not, that ye be not judged. (The Bible)	329
27.	(1)	God helps those who help themselves	325
28.	(30)	There is no open door to the temple of success—every man who enters must forge his own key	320
29.	(23)	Don't postpone unpleasant things—get rid of them. (Elizabeth Lee)	318
30.	(89)	Oh wad some power the giftie gie us to see oursel's as others see us! (Robert Burns)	318

RANK	ORIG. NO.		PREFERENCE SCORE
31.	(31)	Nothing venture, nothing gain. (Thomas Tusser)	309
32.	(82)	Where there's a will there's a way	309
33.	(36)	Never put off until tomorrow what you can do today. (Lord Chesterfield)	296
34.	(86)	Success is ten per cent opportunity and ninety per cent intelligent hustle. (Elbert Hubbard)	292
35.	(64)	All work and no play makes Jack a dull boy	289
36.	(35)	As ye sow, so shall ye reap. (The Bible)	288
37.	(78)	A soft answer turneth away wrath	283
38.	(54)	A display of temper is nothing more than displaying weakness. If we could but take the time to stop to think there would be no more anger, for thinking erases anger	271
39.	(81)	Don't cross bridges until you come to them	269
40.	(66)	The Kingdom of Heaven is within you	263
41.	(72)	Trust in the Lord with all thine heart and lean not unto thine own understanding. In all thy ways acknowledge Him and He shall direct thy paths. (The Bible)	259
42.	(40)	A man's reach should exceed his grasp, or what's a heaven for? (Robert Browning)	258
43.	(50)	God is our refuge and strength, a very present help in trouble. (The Bible)	252
44.	(85)	A good deed is never lost. He who sows courtesy reaps friendship, and he who plants kindness gathers love	242
45.	(60)	I will study and prepare myself and some day my chance will come. (Abraham Lincoln)	229
46.	(10)	A stitch in time saves nine. (Thomas Fuller)	222
47.	(65)	You can catch more flies with honey than with vinegar. (Henry IV of France)	222
48.	(13)	Laugh and the world laughs with you; weep and you weep alone. (Ella Wheeler Wilcox)	220
49.	(17)	Look before you leap. (John Heywood)	213
50.	(58)	Words once spoken and eggs once broken are not the easiest things to repair	211
51.	(18)	No man can serve two masters	192
52.	(80)	You can lead a horse to water, but yon can't make him drink	192
53.	(8)	He can who thinks he can. (Virgil)	187

RANK	ORIG. NO.		PREFERENCE SCORE
54.	(11)	Well begun is half done	181
55.	(62)	Nothing was ever accomplished without enthusiasm	179
56.	(15)	Satan finds mischief for idle hands to do	178
57.	(37)	Do what you do with all your might, Things done by halves are never done right	174
58.	(92)	Responsibilities gravitate to the persons who can shoulder them, and power flows to the man who knows how. (Elbert Hubbard)	170
59.	(28)	Do first things first	169
60.	(91)	The road to hell is paved with good intentions	168
61.	(87)	Don't put all your eggs in one basket	164
62.	(68)	The fault, dear Brutus, is not in our stars, but in ourselves, that we are underlings. (Shakespeare)	162
63.	(44)	Circumstances are the rulers of the weak; they are but the instruments of the wise. (Samuel Gover)	157
64.	(69)	Courage is the thing. All goes if courage goes. What says our glorious Johnson of courage: "Unless a man has that virtue he has no security for preserving any other." (James M. Barrie)	152
65.	(21)	The man of the hour seldom watches the clock	146
66.	(34)	Take care of the little things and the big things will take care of themselves	146
67.	(93)	Hear no evil; see no evil; speak no evil	142
68.	(32)	Hitch your wagon to a star. (Emerson)	141
69.	(45)	Empty vessels make the most noise. (Shakespeare)	134
70.	(76)	If I must, I can	131
71.	(14)	Haste makes waste	129
72.	(56)	Nobody can make you a leader by calling you a leader; you become a leader only by assuming leadership	125
73.	(2)	A bird in the hand is worth two in the bush	116
74.	(24)	Be still and know that I am God. (The Bible)	115
75.	(33)	Strike while the iron is hot	111
76.	(41)	Make hay while the sun shines. (Cervantes)	109
77.	(79)	Every cloud has a silver lining	99
78.	(71)	There is a single reason why 99 men out of 100 average business men never become leaders. It is this: They are unwilling to assume responsibility. (Owen D. Young)	97
79.	(75)	In everything give thanks. (The Bible)	95

RANK	ORIG. NO.		PREFERENCE SCORE
80.	(6)	What men can imagine they can do	92
81.	(53)	Trifles make perfection and perfection is no trifle	89
82.	(39)	If the mountain will not come to Mohammed, Mohammed will go to the mountain. (Francis Bacon)	85
83.	(59)	Take care of the minutes and the hours will take of themselves. (Lord Chesterfield)	83
84.	(63)	Nothing great was ever accomplished if all obstacles were first overcome	81
85.	(61)	*Impossible* is a word found only in the dictionary of fools	80
86.	(27)	Make haste slowly	74
87.	(4)	Tend to your knitting	73
88.	(94)	Hold your mouth and spare your soul	67
89.	(77)	Do the hard things first	66
90.	(25)	I am too busy to be in a hurry	65
91.	(38)	Pride goeth before destruction and an haughty spirit before a fall	60
92.	(5)	Pride goeth before a fall	58
93.	(90)	Nothing is so difficult but that it may be found out by seeking. (Terence)	52
94.	(88)	Plow deep while sluggards sleep and thou shalt have corn to sell and to keep. (Benjamin Franklin)	51
95.	(20)	Let sleeping dogs lie	44
96.	(67)	Circumstances—I make circumstances. (Emerson)	34

A critical examination of these statements reveals the fact that some of them when taken literally are not entirely true and some statements are contradictory to others in the list. The meanings attributed to such statements by those who found them helpful, no doubt are obvious and general meanings, with certain accepted qualifications in the minds of these persons.

The general group of 110 persons, 57 men and 53 women, is representative of the general population. It is interesting to note that the selections by the various individual groups agreed in the main with this general group. The chief differences are that the psychologists placed "Know thyself" first and ahead of the Golden Rule. This may be due in part to

professional bias in assuming that a knowledge of human nature is basic to all understanding and guidance of conduct. The ministers gave somewhat higher value to some of the statements from the Bible. The philosophers agreed with the general group fairly closely. They rated lower than other groups such a quotation as "Trust in the Lord with all thine heart and lean not unto thine own understanding. In all thy ways acknowledge Him and He shall direct thy paths." The educators, principals and teachers, rated "Know thyself" higher than the general group possibly also because of professional leanings.

From a statistical point of view it is interesting to note that the first 50 persons, 25 men and 25 women, in the general group of 110 persons show a combined result closely similar to the final results based on the total group of 600 persons.

An examination of the 96 statements makes evident the fact that quite a number have meanings similar to others in the list. I have attempted to see how many basic statements there may be in this list if allowance is made for those with similar meanings. I started with the one at the head of the list with the largest preference score, namely, the Golden Rule, and compared it with all the other statements. There are seven other statements which have fundamentally the same meaning, for example, "The only way to have a friend is to be one," or "Live and let live." Then I took the second highest statement in the list "Know thyself" and by a similar process of comparison I found that there were eleven statements with similar meanings, such as "Oh wad some power the giftie gie us to see oursel's as others see us!"

By this process of comparison there are only six or seven basic principles or concepts among the 96 which have high preference scores as follows:

1. The principle of *reciprocal behavior,* if we may call it that, as expressed in the Golden Rule.

2. The principle of *psycho-dynamics,* if we may use that phrase, to indicate the importance of understanding human nature as expressed in Socrates's statements, "Know thyself."

3. The principle of *auto-dynamics* or self-effort typified in the statement "Life is what you make it," or "Anything that is worth doing at all is worth doing well," or "If at first you don't succeed, try, try again."

4. The principle of *hedo-dynamics,* or the value of happiness and optimism as expressed in the quotation, "The great essentials of happiness are something to do, something to love, and something to hope for."

5. The principle of *ideo-dynamics* or the power of thinking, ideas, and knowledge as typified in the statements "As a man thinketh in his heart so is he," or "Knowledge is power."

6. The principle of *balance and synthesis* as typified in the statement, "Be calm and self-possessed, know what you are about, be sure you are right, then go ahead and don't be afraid."

7. The principle of *deo-fidelity* or trust in a divine being as expressed in the quotation "Trust in the Lord with all thine heart and lean not unto thine own understanding. In all they ways acknowledge Him and He shall direct thy paths."

It appears therefore that the basic principles of conduct considered most valuable by a group of 600 persons may be reduced to a relatively small number.

The judgments obtained from the men and the women agree closely with a few exceptions. Among the seven principles just mentioned there are significant differences with respect to two, namely, No. 4 and No. 7. The quotation "The great essentials of happiness are something to do, something to love, and something to hope for," stands considerably higher with the women than with the men. It ranked third with women and tenth with men among the total list of 96. The quotation "God is our refuge and strength, a very present help in trouble," ranked substantially higher with women than with men. It was twenty-fifth with the women and fifty-fourth with the men. These differences apparently agree with other known differences between men and women. The higher ranking of the statement about happiness is in line with the

somewhat greater subjective attitude of women. The higher ranking of the quotation "God is our refuge, etc." is in line with the greater religious interest of women.

Other perhaps less significant differences may be observed in the following list showing the first 25 statements for the women and men separately and the corresponding ranking in the other group.

ORIG. NO.		RANK FOR MEN	RANK FOR WOMEN
49	Do unto others as you would that they should do unto you	1.	1.
7	Know thyself	2.	2.
9	Anything that is worth doing at all is worth doing well	3.	4.
3	If at first you don't succeed, try, try again	4.	5.
42	Knowledge is power	5.	7.
12	As a man thinketh in his heart, so is he	6.	8.
57	Actions speak louder than words	7.	14.
52	It is important to act, it is more important to think, but the most important thing of all is to think and act	8.	15.
84	The only way to have a friend is to be one	9.	6.
83	The great essentials of happiness are something to do, something to love, and something to hope for	10.	3.
95	If you can't say good about people, say nothing	11.	11.
55	Be calm and self-possessed, know what you are about, be sure you are right, then go ahead and don't be afraid	12.	13.
26	An ounce of prevention is worth a pound of cure	13.	16.
43	A good way to relieve the monotony of any job is to think up ways of improving it	14.	21.
29	Life is what you make it	15.	9.
22	Live and let live	16.	24.
70	Give to the world the best that you have and the best will come back to you	17.	19.
48	This above all: To thine own self be true, And it must follow, as the night the day, Thou canst not then be false to any man	18.	10.

ORIG. NO.			
19	To err is human; to forgive divine	19.	18.
60	I will study and prepare myself and some day my chance will come	20.	47.
51	Where there is no vision, the people perish	21.	31.
73	A man's real limitations are not the things he wants to do but cannot; they are the things he ought to do but does not	22.	26.
89	Oh wad some power the gifte gie us to see oursel's as others see us!	23.	30.
47	Man does not live by bread alone	24.	30.
16	Self-trust is the first secret of success	25.	20.
96	True worth is being, not seeming	27.	12.
74	The only way in which one human being can properly attempt to influence another is by encouraging him to think for himself	31.	17.
46	Judge not, that ye be not judged	39.	22.
31	Nothing venture, nothing gain	53.	23.
50	God is our refuge and strength, a very present help in trouble	54.	25.

THE EMOTIONAL STABILITY OF THE TRANSIENT

W. H. BRENTLINGER
University of Texas

INTRODUCTION

IN a previous article the results of testing a group of transients registered in the Texas Transient Bureau with the Pressey Senior Classification Test, the Thorndike Test for Word Knowledge, and the Minnesota Vocational Test for Clerical Workers were reported, along with the age, educational status and occupational experience of the group. This study reports results obtained from the Woodworth Personal Data Sheet (referred to hereafter as the P. D. Sheet) which was administered at the same time, and compares the transient with several other groups which might be considered the best available for comparison.

At the time this study was made but one other psychological study of the transient had been reported, which dealt with a city group in Buffalo (1). The results showed the average intelligence of transients to be somewhat below that of adult males of Minnesota. They also agree with our findings. The majority had had little schooling, although the Transient Service of the FERA in Los Angeles is reported to have found that among 5000 transients between 15 and 20, sixty per cent had had at least some high school education (2). It was further reported that on an abridged form of the Woodworth Personal Data Sheet the transients, compared with two groups of high school seniors, tended to give the responses of the academically inferior.

The Woodworth P. D. Sheet[1] includes typical symptoms of neurotic personality, such as dizziness, fear of crossing a

NOTE: The original questionnaire is given in full in Hollingworth, H. L., The Psychology of Functional Neuroses, 1920, pp. 120–126. The numbering of items in this report is the same.

bridge, inability to stand the sight of blood, and numerous other evidences of exaggerated emotionality. The subject is asked to answer each question by drawing a line under Yes or No. The score is the total number of unfavorable or "neurotic" answers, the wrong answer being sometimes Yes and sometimes No. The average score of neurotic subjects as reported by Woodworth is 36 and the average for normal subjects is 10 (3). Franz is quoted as stating that "probably any individual who answers 20 of the questions wrongly should be suspected of instability. . . . If the number of wrong answers is greater than 30 grave suspicion of abnormality is warranted" (4). The reliability of the questionnaire by split-halves is reported to be about .90.

Most of the later questionnaires of Laird, Mathews, House, Bernreuter and the Thurstones contain items identical with or similar to those in the P. D. Sheet. To quote the Thurstones, "Professor Woodworth's list is so well edited that we have not succeeded in making any improvement on it except for the increase in the length of the list whereby its reliability is raised" (5). The form used in the present study was one available to the writer and contained 111 items, five less than the original form. Questions omitted from the original were Nos. 6, 44, 47, 48, 49, 50, 51, 52, 81, 88. Most of them refer to habits and attitudes relating to sex. Five questions were substituted, principally because they could be answered frankly without hesitation. These changes probably reduced the score which would have been made had the group been tested with the original form, although the omitted questions are not those which are most frequently answered by neurotic personalities in the symptomatic way. The results of this study as described in later sections, are considered comparable to results obtained by use of similar forms of the P. D. Sheet. The fact that some questions were omitted and others substituted in no way interferes with comparison of the transients with the student groups reported herein, for reasons which appear later.

Hollingworth (6) published a study based upon 318 cases from the army psychiatric hospital at Plattsburg, all of whom were diagnosed "psychoneurotic" or some other form of neurosis. He found a surprising decrease in number of symptoms reported after the armistice, which he held to indicate the importance of motivation in the disappearance of psychotic symptoms.

Bridges (7) found, as a result of testing 136 college men and 32 college women, that the symptoms most frequent among students were of the anxiety type, and included disturbed sleep, tendency for perseveration of ideas, worry, irritability and self-consciousness. Students are reported "perhaps more unstable than the average of the general population;" 10 per cent of the men and 25 per cent of the women exceeded a score of 25. Garrett and Schneck (8) tested a group of 103 students at Columbia University. Attempt was made to determine which questions were diagnostic and which were answered equally often by normal and neurotic subjects. They further attempted to determine if some questions would differentiate among the classes of neurotics, but without success; with the exception of certain questions answered more frequently by neurasthenic patients the answers allowed no differentiation. They emphasize that the blank as a whole may be less diagnostic than selected items. Ball (9) tested 92 young prisoners, averaging 21 years of age, with the Woodworth-Cady and the Woodworth questionnaire and found that the latter was more satisfactory. Comparing his group with Hollingworth's subjects, he found the prisoners gave a more symmetrical distribution, with less variability and lower scores than the soldier group.

The foregoing studies are evidence that the P. D. Sheet is capable of giving information of value about members of the transient population. This sheet also permits us to compare the transient with other groups. It seems to be adapted to the purpose of this study, i.e., analysis of the personal characteristics and emotional stability of transient men. The ques-

tionnaire is phrased in fairly simple language, and can be answered more easily than other questionnaires of a like subjective nature.

PROCEDURE IN TESTING AND SCORING THE TESTS

The transients were tested in four groups during the winter of 1934–35. The requirements for selection of the men to be tested were that they be not over 50 years of age and have at least fifth grade education. No other criteria were stated, but it was later found that some of the men had been included because they were giving some service to the Bureau, or because they expressed an interest in tests. Comparisons made with other groups tested with the P. D. Sheet are likely to show the effect of selection factors at work in our testing. The present group is not a "fair sample" of the transient population but is probably superior in education and mental ability.

Full time to complete the test was allowed to all, and with a few exceptions the men seemed to be able to answer the questions without great difficulty. They had previously taken two short mental tests and were allowed a recess before they were given the vocabulary test and the P. D. Sheet. The attitude of the group was quite cooperative; they were generally willing to answer frankly facts relating to their past lives and their present attitudes.

The scoring was done by student assistants working under the writer's direction, each being checked by at least one other. The item analysis in this study was accomplished by punching the data into Hollerith cards and sorting and counting them on the Hollerith machine. This assured an accurate tabulation of answers to each of the 111 items. Sorting was done by age groups, allowing certain conclusions to be drawn regarding changes in answer in relation to age.

RESULTS

Table I presents the distribution of scores for our group, and the two Hollingworth groups, the entire group he re-

ported, and that section of the entire group that answered the questions after the armistice. The mean score of transients is 16.3, with S. D. 11.3. For purposes of comparison with other groups the median, 13.2, and the semi-interquartile range, 7.6, are also given. Our group, as previously stated, was not homogeneous, for the men tested at San Antonio averaged 3.1 points higher than those in the camps or at Austin. This difference may be accounted for in part by different processes of selection, and in part by the possibly more favorable surroundings of the groups tested in the camps.

TABLE I

Distribution of Scores of Transients and Army Psychoneurotics on the P. D. Sheet

SCORE	FREQUENCY		
	Transient Group	Army Groups	
		Entire	Post-armistice
0– 4	30	60	50
5– 9	50	49	30
10–14	40	61	53
15–19	32	33	18
20–24	19	23	12
25–29	18	24	10
30–34	14	13	5
35–39	11	9	2
40–44	3	13	3
45–49	1	18	12
50–54	1	6	1
55–59	1	5	3
60–64	0	3	2
65–	0	2	2
Total	220	319	202
Mean	16.3	19.0	16.0
S. D.	11.3	15.6	13.7
Q_3	22.4	27.8	20.2
Median	13.2	14.2	12.0
Q_1	7.2	7.0	5.1
Semi-interquartile range	7.6	10.4	7.5

It is apparent that the transients have a lower mean score and are less variable than the entire army psychoneurotic group. If the post-armistice group is the basis of comparison, the difference in the means of the two groups is 0.3 points, in favor of the army group, which is a peculiar finding until we take into account the fact that the psychoneurotic soldiers were found to give a greatly reduced total score when their motivation changed. If the transients are compared with the whole army group, however, the difference is 5.4 in favor of the transients, and the S. $D._{(diff.)}$ is .96, which is practical certainty that we have a true difference. Next, let the scores of the upper 25 per cent of cases in the two groups, transient and post-armistice, be compared. The average score made by men in the upper 25 per cent of the transient group is 32.5 (55 cases); the average of the men in the upper 25 per cent of the post-armistice group is 37.2 (51 cases). Since only those who score above 20 are to be considered "abnormal" in the opinion of Franz and others, the transient group represents lower scores among those who can be considered problem cases than does the post-armistice group. The distribution of scores is more regular for the transient than for the army groups and indicates at least a group more like the general population.

It is not intended to minimize the extent to which the higher score of our group indicates a trend toward susceptibility to neurosis in the transients. Comparisons will next be made with other subject groups tested with the P. D. Sheet, under conditions more like those of normal living than prevailed for the army group. The best comparison available, since the changes in the questionnaire were similar to the changes (deletion of certain items) in our form, is Bridges's university student group. His subjects were from both the arts college and the medical school of Toronto University, the majority coming from the second and third year medical classes. The average age of his subjects is not reported but it is estimated that his subjects averaged about 22 years of age.

The transients are found to be 2.7 points higher than the college students; S. $D._{(diff.)}$ .99 (calculated from the above data). The chances are about 99.7 in 100 that there is a true difference and not merely one due to the sampling error. While Bridges concluded that "on the whole students are perhaps more unstable than the average of the general population," it seems that the student group represents a fairly good comparison for the transients. On this basis, transients are enough higher in emotional maladjustment to make it necessary for those administering transient bureaus to look for suspicious cases and to attempt to discover means of handling them.

COMPARISON OF THE TRANSIENT GROUP WITH STUDENT GROUP ON A SELECTED LIST OF 42 QUESTIONS

In the introductory section reference was made to the study of Garrett and Schneck, in which they attempted to determine which questions on the P. D. Sheet are really diagnostic. They compared the answers of an unselected group of Columbia College freshmen with those of Hollingworth's group. Each of the P. D. Sheets of the psychoneurotic subjects was gone through; and a record made of the number of wrong answers returned by each man. A similar tabulation was made of the P. D. Sheets of 103 freshmen. Questions 47, 48, 50, 51, and 52 were omitted from the sheet administered to the freshmen, which makes the number of questions in their form exactly that which we used in testing the transient group.

Transients were first compared with the freshmen and also with two groups of Hollingworth's subjects, whose diagnosis is "neurasthenia" and "psychoneurosis," on the basis of total score. It appears that the freshmen are as "neurotic" as the transients and are nearly as much so on the basis of total score as the diagnosed neurotics. The authors did not expect differentiation on the basis of total score, and selected 42 questions to score which were (1) wrongly answered by the psychoneurotic group in excess of the freshmen group by 10 per cent

or more of the cases, and (2) found to show a return of 20 per cent (at least) of wrong answers in the abnormal group. The means, standard deviations, and probable errors of the difference in means of the groups are shown in Table II. In the case of the transients, all 42 items of the selected list were available for scoring. They were scored by punching only those items in a Hollerith "key" card and counting the score for each individual from his punched card.

TABLE II

Comparison of Transients, Freshmen, and Psychoneurotic Soldiers on a 42 Question P. D. Sheet

	MEAN	S.D.	$S.D._{(av.)}$	$S.D._{(diff.)}$	DIFF.	$D./S.D._{(diff.)}$
Transients	8.62	5.83	.393	.556	1.80	3.24
Freshmen	6.82	3.96	.394	.....	.....	.....
Psychoneurotics	11.73	8.49	.531	.661	3.11	4.71

The transients are differentiated by a reliable difference from both the other groups, and appear definitely more unstable than the freshmen, but less so than the psychoneurotics. The distribution of scores on the shorter list is given in Table III.

It is believed possible now to determine, by a more satisfactory critical score than that offered by Franz, which subjects in the transient groups are most likely to display abnormal behavior. The 42 questions selected from the total list provide satisfactory differentiation if the evidence of the above section is acceptable. It is suggested that the score of 14 be taken as a lower critical score, and that anyone making more than that on the 42 questions should be considered a possible problem case. The critical score of 14 is equal to the average plus 1 S. D. It is further suggested that a score of 18 or over be used to indicate a "problem case," since it is the opinion of Garrett and Schneck that this score would "lay one open to very strong suspicion" of abnormality. Fourteen cases, or 6.3 per cent of the group, are included by taking 18 as the

TABLE III
Distribution of Scores of Transients on 42 Selected Items

SCORE	FREQUENCY
0– 1	18
2– 3	29
4– 5	41
6– 7	32
8– 9	28
10–11	19
12–13	13
14–15	16
16–17	10
18–19	4
20–21	3
22–23	4
24–25	1
26–27	0
.....	.....
32–33	2
Total	220
Mean	8.62
S. D.	5.83

critical score for problem cases, while 32, or 14.5 per cent of the group, are open to suspicion.

COMPARISON OF TRANSIENT GROUP WITH OTHER GROUPS IN ANSWERS TO SINGLE QUESTIONS ON THE P. D. SHEET

The transient group is next compared with other groups on questions which are found to be most frequently answered symptomatically. It is possible to do this with the data reported by Hollingworth and by Ball; in both cases the authors have reported the per cent of wrong answers to single items. In making these comparisons our 20–29 year age group, containing 98 cases, was used because the factor of age was found to influence the answers to some of the questions. Questions most frequently answered by Hollingworth's group included those referring to sleep disturbances, worries, desire to steal,

queer, unpleasant feelings in some part of the body, bad headaches, not feeling well rested in the morning, etc. The army group reported physical symptoms frequently while the transients very seldom report this type of symptoms. The answers of the transients include frequent change of mood, becoming tired of things quickly, or frequent change of interest, and not knowing what to do next. Because of the separation of Hollingworth's cases into pre-armistice and post-armistice, it is difficult to make statistical comparisons. It seems better to make a more extensive comparison with Ball's prison group.

The prisoners averaged 21 years of age, which is somewhat younger than the average of the 98 transients with which they are compared. It was found, however, that if the lowest age group of the transients had been included with the 20–29 age group the per cent of positive answers would not have changed appreciably. The results are summarized in Table IV, which gives the number of questions, frequency of response of 20–29 year transients, per cent of positive answers, and per cent of prison group giving positive or wrong answers. Three sections are provided in the table, Section I containing questions classed as present condition, Section II questions of definite historical fact, and Section III indefinite questions. This corresponds with Hollingworth's classification.

It will be seen that questions in Section I answered significantly by 25 per cent or more of transients include Nos. 10, 59, 67, 92, 95, and 97; by 25 per cent or more of prisoners, Nos. 10, 59, 92, 93, 95, and 97. Questions not included in the table for which Ball found 25 per cent or more positive answers are Nos. 8, 68, 84, and 94. In Section II transients give more significant responses to Nos. 25, 30, 33, and 85; prisoners, to Nos. 31, 42, 36, and 37. It may be remarked that Hollingworth's group was characterized in this class of questions by more answers indicative of definite neurotic disorder, such as motor tics, habits of biting the finger nails, fainting and spells of dizziness. In Section III (termed indefinite because the questions refer neither to present nor past condition spe-

TABLE IV

Frequency of Significant Responses to Questions Answered by 20 Per Cent or more of Transient Group with Comparable Data from a Group of Young Prisoners

	NO. OF QUESTION	FREQUENCY OF RESPONSE-TRANSIENT	PER CENT	
			Transients	Prisoners
Sect. I	10	30	30.6	40.0
	59	28	28.6	35.0
(present	67	40	40.8	22.4
condition)	70	24	24.5	21.3
	73	24	24.5	10.6
	92	36	36.7	28.8
	95	25	25.5	33.0
	97	43	43.9	53.0
Sect. II	25	23	23.4	20.2
	30	24	24.5	21.3
(historical)	31	24	24.5	36.2
	32	29	29.6	44.7
	33	20	20.4	13.8
	36	50	51.0	64.0
	37	54	55.1	69.0
	85	28	28.6	22.4
Sect. III	12	20	20.4	26.6
	13	33	33.7	29.8
(indefinite)	16	21	21.4	35.0
	69	30	30.6	36.2
	71	25	25.5	20.2
	112	20	20.4	19.1
	115	49	50.0	49.0

cifically) the prison group answers more frequently question 16, indicating that they are bothered by blushing. This is a question which is directly related to age, as we report later on. In most respects the answers given by transients and prisoners show similar trends, but the prison group exceeds the transient in the per cent of wrong answers to the majority of questions. The average score of the prisoners was reported as 17.83, S. D. 9.75, compared with the average score of the transients, 16.29, S. D. 11.31.

What are the emotional characteristics of transients as compared with those of a group of nearly similar age, and one

which might be expected to show on the entire questionnaire about as much emotionality as the transients? Any differences found should help to determine the motivation which leads to transiency, a question concerning which there is much doubt. The above comparison of the two groups yields a partial answer to this question. There are few questions on which the difference in answer of the two groups is more than a few per cent, but there are two items, at least, which seem to offer some suggestion of the determining factors in transiency. To the question, "Do you make friends easily?" the transients answered "No" in 15.7 per cent of answers, the prisoners in 26.6 per cent of answers. This would characterize the transients as more friendly, at least more sociable in their inclinations. This finding accords with the observations of others. To the question "Do you usually know just what you want to do next?" transients respond with "No" 40.8 per cent of the time, prisoners 22.4 per cent of the time. There is also a difference, the transient exceeding the prison group, on questions 30, 70, 73, 85, and 92. Transients report they cannot sit still without fidgeting and that they had the habit of biting their finger nails more than prisoners. This may be indicative of general restlessness, rather than neurotic disposition.

In order to determine the reliability of differences in per cent of response for the two groups, the formula for this purpose was used in preparing the table below (10).

NUMBER OF ITEM	GROUP GIVING HIGHER PER CENT WRONG ANSWER	$D/_{S.D.\,(diff.\ of\ propn.)}$
16	Pr.	2.15
32	Pr.	2.32
36	Pr.	2.00
37	Pr.	2.14
67	Tr.	2.73
73	Tr.	2.41
84	Pr.	2.76
43	Pr.	1.83

When the most important differences in the two groups are studied by this method, we find that one or the other has answered more frequently to a reliability of two times the standard error of the difference, but in no case do they differ by as much as three times the error.

CHANGES IN RESPONSE WITH AGE

In order to determine how answers on the more significant items change with age, our group was divided into four subgroups, with respective age limits of 15–19, 20–29, 30–39, and 40 and over. The difference in per cent of responses to items which showed a rather high frequency of response at all ages were seldom large enough to be reliable, except between the youngest and oldest groups. While some changes are directly related to age, as on questions 10, 16, 30, 31, 37, 38, 71, 91, these are not great enough to invalidate the comparisons made in the preceding section. The changes are as follows:

Tendency for significant response to increase with age: Questions 10, 25, 91.

Tendency for significant response to decrease with age: Questions 16, 30, 31, 37, 38, 84a.

Younger men are more likely to report that they were unhappy between the ages of 14 and 18, that they were not always treated right by their family, and that people find fault with them more than they deserve. This tendency is shown for several questions not reported in the list of questions above, for example, the question "Did the teachers in school generally treat you right?" is answered "No" by steadily decreasing percentages in the succeeding age groups. It is likely that among younger men the idea that one is not being fairly treated at home is one of the most important causes contributing to transiency. It would be entirely incorrect to suppose that the occurrence of such motives is limited to transients, but there is no doubt that family troubles and inability to find security and healthy outlets for youthful impulses at home are important causes of this condition.

CONCLUSIONS

The preceding sections have reported results from the use of the Woodworth P. D. Sheet to determine the emotional stability of transients. By comparison of our results with reported results from testing other groups it has been possible to state some ways in which the transient differs from other groups. The results reported are tentative and require further verification.

1. The Woodworth P. D. Sheet is capable of providing a convenient measure of the emotional stability of the transient. The questionnaire was answered by the majority of the men tested without difficulty.

2. The mean score of the transient group on the entire questionnaire of 111 questions is 16.3, S. D. 11.3; the median score is 13.2; the semi-interquartile range 7.6. Scores of transients average approximately six points higher than the score for normal subjects reported by Woodworth, and .7 points higher than a group of college students tested on a comparable form by Bridges. Compared with a group of psychoneurotic soldiers, transients show a lower average score and fewer extreme cases.

3. Scores of the transients on 42 items selected from the entire questionnaire as differentiating neurotic individuals from non-neurotics are compared with scores for college freshmen and those for diagnosed psychoneurotics. The differences are reliable between all groups, and indicate that transients are more like the students than they are like the psychoneurotics.

4. The use of 42 items from the P. D. Sheet rather than the entire questionnaire is recommended for future testing of transients. Under this condition critical scores of 14 and 18 are suggested to determine "suspicious" and "problem" cases. The lower score is the average of the group plus 1 S. D.; the higher is one suggested by Garrett and Schneck.

5. When these critical scores are used, the per cent of transients who become "problem cases" is 6.3 per cent of the group

tested, while 32 cases, or 14.5 per cent of the group, are open to suspicion.

6. Transients are compared with other groups on their answers to particular items of the questionnaire. The per cent of significant responses is greater for the transient group on certain questions, which may be an indication of the motivation of transients. The transient is characterized by frequent change of interests, not knowing what he wants to do next, and restlessness. There is some evidence that the younger transients are more motivated by feelings of insecurity and unhappy home environments.

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EFFECTIVENESS OF CHILDREN'S RADIO PROGRAMS

H. P. LONGSTAFF
University of Minnesota

RECENT studies of consumer buying have revealed that about eighty-five per cent of retail sales are made to women. On the basis of these studies we find great emphasis being placed on the importance of directing advertising at the female buyer. Kenneth Goode, for example, states that the "only completely basic industry in America is raising girl babies."[1] In certain respects this is true but it must be borne in mind that women's purchases are influenced in part by the desires of those for whom the purchases are being made. Though it may be true that Mrs. Consumer buys Mr. Consumer's suits, sox, shoes, etc., *undoubtedly Mr. Consumer has some voice in the type of article she purchases and not only Mr. Consumer but also Mrs. Consumer's children.* This was definitely proved in a recent study made for the National Broadcasting Company by the Psychological Corporation.[2] Quoting from this study, "The influence of children was found to be extremely high among purchases made by adults in grocery and drug stores." This being true, the present study was undertaken to investigate the effectiveness of children's radio programs as advertising mediums and their effectiveness in influencing the buying behavior of the children's parents.

Specifically this study was undertaken to discover the following information:

1. What per cent of children listen to the program herein studied?

[1] Goode, Kenneth. Modern Advertising Makes Money, p. 15, Harper & Bros., New York, 1934.

[2] A Study of the Relative Effectiveness of Major Advertising Media. National Broadcasting Company, Inc., New York, 1934.

2. The extent of children's knowledge of the products advertised by the various programs.
3. The relation between knowledge of the program and use of the commodity.
4. The relative popularity of the various programs.
5. The relationship between intelligence (as measured by age, school grade standing) and knowledge of program.
6. The relation between intelligence and the extent of use of the commodities advertised.

The data for this study were obtained by having college students interview 1,020 children. The interviewers were students in the course in Applied Psychology at the University of Minnesota. They were instructed verbally by the writer in the technique of making these interviews, and in addition they were given a mimeographed sheet of instructions. The following questionnaire was used to record the information obtained in the interview.

Name ..... Sex: M— F—

Address ..... School Grade .....

1.—Do you have a radio in your home? Yes— No— Don't know—
2.—Do you listen to the Skippy program? Yes— No— What product does this program advertise? Phillips— Other .....
Don't know— Do you have any Phillips at home now? Yes— No— Don't know— Have you ever had any Phillips at home? Yes— No— Don't know—
3.—Do you listen to the Buck Rogers program? Yes— No— What product does this program advertise? Coco-Malt— Other .....
Don't know— Do you have any Coco-Malt at home now? Yes— No— Don't know— Have you ever had any Coco-Malt at home? Yes— No— Don't know—
4.—Do you listen to Jack Armstrong? Yes— No— What product does this program advertise? Wheaties— Other .....
Don't know— Do you have any Wheaties at home now? Yes— No— Don't know— Have you ever had any Wheaties at home? Yes— No— Don't know—
5.—Do you listen to the deep sea adventures of Davy Jones? Yes— No— What product does this program advertise? Hair Root Oil— Other ..... Don't know— Have you any hair root oil at home now? Yes— No— Don't know— Do your parents use it? Yes— No—Don't know— Have you ever had any hair root oil at home? Yes— No— Don't know—

6.—Do you listen to Jimmy Allen? Yes— No— What product does this program advertise? Skelly Gasoline— Other .....
Don't know— Does your father buy Skelly Gas? Yes— No—
Don't know— Has he ever bought Skelly Gas? Yes— No—
Don't know—
7.—Do you listen to Little Orphan Annie? Yes— No— What product does this program advertise? Ovaltine— Other .....
Don't know— Do you have any ovaltine at home now? Yes—
No— Don't know—
8.—Which of these programs do you like best? Skippy— Buck Rogers— Jack Armstrong— Davy Jones— Jimmy Allen— Little Orphan Annie—
9.—How old are you? Seven— Eight— Nine— Ten— Eleven— Twelve— Thirteen— Fourteen— Fifteen—
Interviewer's name .....

The subjects were 590 boys and 430 girls living in Minneapolis and St. Paul, Minnesota. Table I contains data indicating the nature of the group of subjects.

TABLE I

SEX	N	PER CENT	AGE	SCHOOL GRADE	PER CENT HAVING RADIO IN HOME
Male	590	58	M = 11.35 σ2.21	M = 6.18 σ2.24	Yes 98%
Female	430	42			No 2%

These subjects were selected at random. Wherever an interviewer could find a child he interviewed him, although the bulk of the interviews were made with the children in their homes. The figure, 98 per cent having radios in their home, may seem to some to be too high but such is not the case. On January 1, 1935, 93.4 per cent of homes in cities over 250,000 population owned radios.[3] It is highly probable that the bulk of the other 6.6 per cent was represented by class D homes which we did not sample in this study. Consequently, our sample is probably representative.

Table II contains the data pertinent to the programs investigated. It is apparent from a study of this table that four of the six programs were of equal duration and were presented

[3] Lost about 2½ Million Souls and Found. Publication by Columbia Broadcasting Co., New York, 1935.

TABLE II

NAME OF PROGRAM	CHAIN	PRODUCT ADVERTISED	HOUR OF DAY	NO. OF TIMES PER WEEK	DURATION	LENGTH OF TIME WITH THIS SPONSOR
Skippy	CBS	Phillips Milk of Magnesia Toothpaste	5:15 P.M.	5	15 min.	2 yrs.
Buck Rogers	CBS	Coco-Malt	6:30 P.M.	4	15 "	2 "
Jack Armstrong	CBS	Wheaties	5:30 P.M.	5	15 "	2 "
Deep Sea Adventures of Davy Jones	NBC	Hair Root Oil	5:30 P.M.	2	15 "	2 "
Jimmy Allen	CBS	Skelly Oil and Gasoline	6:00 P.M.	5	15 "	3 yrs.
Little Orphan Annie	NBC	Ovaltine	5:45 P.M.	5	15 "	3 "

the same number of times each week. The two exceptions were the "Buck Rogers" program which was presented four instead of five times a week and the "Deep Sea Adventures of Davy Jones" which was presented only three times a week. This latter program was also quite new to this audience having been on the air only two months.

Table III indicates the per cent who listen to each program, associate program and product, and use or have used the product.

TABLE III

Per cent who listen to program, associate program and product, use product, and have used product

PROGRAM	PER CENT WHO LISTEN	PER CENT WHO ASSOCIATE PRODUCT	PER CENT WHO USE PRODUCT	PER CENT WHO HAVE USED THE PRODUCT	PER CENT WHO USE OR HAVE USED PRODUCT
Jimmy Allen	83	76	21	20	41
Jack Armstrong	78	80	64	30	94
Buck Rogers	75	74	20	35	55
Orphan Annie	70	80	30	42	72
Skippy	59	63	11	25	35
Davy Jones	13	9	6 children 4 parents	7	17

It is evident that all the programs except "Skippy" and "The Deep Sea Adventures of Davy Jones" are very popular and listened to by the majority of children. It is really amazing that these programs have such large audiences. It is a much larger per cent of listeners than is obtained by adult programs and far greater than is usually found with other advertising media. It is evident then that children do listen to the children's radio programs; they associate program and commodity it advertises (which is one of the major aims of any advertisement) and the programs have been successful in selling the product they advertise.

There is a large gap, however, between the per cent who now use the product and those who have used it. In other

words, this method of advertising has been highly successful in selling the commodity but not so successful in holding customers after they have once purchased.

The low standing of "The Deep Sea Adventures of Davy Jones" may be due to the fact that it had been on the air only a short while when these interviews were made, also because it was given only three times a week as compared with four or five times per week for the others. As a matter of fact it would seem that this program was being quite successful considering its newness, number of times presented a week, and the nature of the commodity advertised.

Results presented in Table IV indicate that a much larger per cent of those who associate program and product use the commodity than do those who do not associate program and product. Thus we see the importance of associating program and product in the child's mind.

Table V indicates the popularity of each program for children of various ages.

The popularity of Jack Armstrong, Skippy, and Little Orphan Annie decreases as the children get older while Jimmy Allen and Buck Rogers increase in favor with the older children. It is also interesting that Jimmy Allen is considered the most popular program with all age groups except age 7. This finding should be of value to those interested in discovering the type of entertainment children like most.

Table VI is a cross check on Table V. Here again we find that the Skippy and Orphan Annie programs decrease in popularity with the older children.

Another interesting fact brought out by these data is that listening to these programs reaches the peak at the ages 9, 10, 11, and 12 years of age. Here again the data are of value in throwing light upon the content of radio programs for children. Present programs evidently have a tendency to be too advanced for the younger children and too elementary for the older ones.

TABLE IV

Effect of association of program and product on present and previous use of the commodity

PROGRAM	GR. 1 NO. WHO ASSOCIATE PROGRAM & PRODUCT	GR. 2 NO. WHO DO NOT ASSOCIATE PROGRAM AND PRODUCT	PER CENT OF GR. 1 WHO USE PRODUCT	PER CENT OF GR. 2 WHO USE PRODUCT	PER CENT OF GR. 1 WHO HAVE USED PRODUCT	PER CENT OF GR. 2 WHO HAVE USED PRODUCT
Jimmy Allen	775	245	26	7	23	11
Jack Armstrong	817	203	72	33	32	24
Buck Rogers	754	266	22	12	41	18
Orphan Annie	817	203	35	14	47	20
Skippy	641	379	16	4	31	15
Davy Jones	90	930	12	5	11	6

TABLE V

Relations with Age

Per cent of children of different ages who like various radio programs the best

NO. AT EACH AGE	AGE	JIMMY ALLEN	JACK ARMSTRONG	BUCK ROGERS	ORPHAN ANNIE	SKIPPY	DAVY JONES	STATED FAVORITE PROGRAM AT THIS AGE
76	7	20	30	13	23	13	1	Jack Armstrong
97	8	35	26	12	18	7	2	Jimmy Allen
130	9	44	27	11	6	7	5	" "
155	10	47	20	11	13	8	1	" "
153	11	43	24	10	15	4	4	" "
149	12	47	22	19	10	1	1	" "
122	13	49	20	17	7	5	2	" "
87	14	57	14	23	2	4	0	" "
51	15	54	11	26	2	0	7	" "

TABLE VI

Per cent of children of different ages who listen to various radio programs

AGE	JIMMY ALLEN	JACK ARMSTRONG	BUCK ROGERS	ORPHAN ANNIE	SKIPPY	DAVY JONES	FAVORITE PROGRAM AT THIS AGE BASED ON PER CENT LISTENING
7	78	82	72	83	79	17	Orphan Annie
8	84	79	78	76	68	12	Jimmy Allen
9	87	82	79	75	68	12	" "
10	86	86	74	81	68	17	Jimmy Allen & Jack Armstrong
11	84	84	79	82	69	18	" "
12	87	73	79	68	53	10	Jimmy Allen
13	85	74	78	59	42	8	" "
14	76	70	69	49	40	9	" "
15	65	45	57	25	25	10	" "

The use of the products is rather evenly distributed among the age groups with no tendency for one group to use more or less than any other.

There are some rather marked sex differences as can be discovered by studying Table VII. It is evident from this table

TABLE VII

Per cent of boys and girls who listen to various programs, associate the program and product, and have used the product

PROGRAM	PER CENT WHO LISTEN		PER CENT WHO ASSOCIATE PROGRAM AND PRODUCT		PER CENT WHO USE PRODUCT		PER CENT WHO HAVE USED PRODUCT	
	M	F	M	F	M	F	M	F
Jimmy Allen	91	72	86	62	26	14	24	16
Jack Armstrong	83	70	86	72	66	61	32	28
Buck Rogers	84	64	82	63	21	18	37	31
Orphan Annie	68	73	79	81	26	36	43	40
Skippy	61	57	67	57	12	10	26	24
Davy Jones	14	11	11	6	7	5	7	7

that with the exception of the Little Orphan Annie program more boys listen to the programs herein studied than do girls. A higher per cent of boys associate program and product and use or have used the commodity. Since the "Orphan Annie" program is the only one in the group where the leading character is a girl and since it is the only one which girls like better than the boys, it might be profitable to add programs directed especially at the girl audience.

Intelligence as measured by school grade reached in relation to age seems to be an unimportant factor. Table VIII shows the per cent of retarded, average, and accelerated children who like the various programs best. These data indicate that the program that is popular with one group is about equally popular with the other groups. It further indicates that the producers of the programs have been very successful in appealing to children's basic interests which appear at a young age and remain relatively important, as the children grow older.

TABLE VIII

Per cent of retarded, average, and accelerated children who stated they like the various radio programs the best

PROGRAM	RETARDED N = 269	AVERAGE N = 631	ACCELERATED N = 120
Jimmy Allen	45	45	35
Jack Armstrong	22	22	23
Buck Rogers	14	14	19
Orphan Annie	10	12	13
Skippy	7	5	4
Davy Jones	2	2	6
	100	100	100

Table IX gives the detailed analysis of the per cent of retarded, average, and accelerated children who listen, associate program and product, and use or have used the commodity. In general, intelligence seems to play a small part for in the majority of instances the groups perform about alike. This indicates that the programs are geared down intellectually to the place where they are easily comprehended by all groups.

This study warrants the following conclusions:

1. A large majority of children listen to children's radio programs.
2. A surprisingly large percentage of those who listen associate program and product. Thus this method of advertising is effective in establishing company name and brand name in the child mind.
3. More boys listen and associate program and product than do girls.
4. This form of advertising is effective in selling commodities in that a large per cent of those who listen and associate program and products actually buy the commodity, although this is not as complimentary as it may seem at first sight. The programs are successful in securing customers but they are not so successful in holding them. This is more pronounced for boys than for girls.

TABLE IX

Per cent of retarded, average, and accelerated children who listen to various programs, associate programs and product, use the product, and have used the product

PROGRAM	(N = RET. 269 ; AV. 631 ; ACC. 120)											
	PER CENT WHO LISTEN TO PROGRAM			PER CENT WHO ASSOCIATE PROGRAM & PRODUCT			PER CENT WHO USE PRODUCT			PER CENT WHO HAVE USED PRODUCT		
	Ret.	Av.	Acc.	Ret.	Av.	Acc.	Ret.	Av.	Acc.	Ret.	Av.	Acc.
Jimmy Allen	87	83	79	78	75	75	22	20	22	21	21	19
Jack Armstrong	81	77	72	80	81	78	65	65	58	31	28	38
Buck Rogers	77	75	75	73	75	73	21	20	17	31	36	38
Orphan Annie	70	71	68	77	83	74	30	30	33	37	45	35
Skippy	65	58	53	62	63	61	16	10	9	30	25	16
Davy Jones	12	13	16	6	10	7	3	7	6	6	6	10

5. Age plays a relatively small part, although the extremes of the age groups do not listen as much as do those between the ages of 9 and 12.
6. More programs designed for girls should be used in order to increase the number of girls who listen to the programs and buy the commodities.
7. The order of popularity of the program is as follows: Jimmy Allen, Jack Armstrong, Buck Rogers, Orphan Annie, Skippy, and Deep Sea Adventures of Davy Jones.
8. Intelligence plays little or no part in determining who listens and what programs will be remembered.

DIFFERENTIAL INTERESTS OF ENGINEERING GRADUATES

GRAHAM B. DIMMICK
University of Kenucky

MINER[1] has shown that pseudo-occupational groups could be differentiated upon the basis of their interests as indicated by preferences in respect to the contrasts in working conditions provided on his Blank for the Analysis of Work Interests. A pseudo-occupational group consisted, for example, of 100 students who had specified their first choice for their own life work as teaching, law, or medicine.

Utilizing the same device, it was the purpose of this study to determine the validity of each item in differentiating a genuine occupational group from: (1) a random group of University freshmen, (2) a group of general psychology students. This study provided also an opportunity for ascertaining the relationship between students of superior academic achievement and those of inferior achievement in required engineering courses in regard to their respective choices of interests and work conditions. The occupational group employed in this study consisted of 60 graduates of the University of Kentucky College of Engineering. This group however does not constitute a random sample of engineering graduates for it was necessary to make a selection of individuals for whom complete academic and personal history records were available. The study therefore excludes those students who had transferred from other institutions and who graduated with the group reported in this study.

The academic standing of each graduate was obtained from records in the office of the registrar. The courses for which the total and average standings were computed consisted only

[2] Miner, J. B., An Analysis of Vocational Interests, School Review, 1925, 33, 744–754.

of those courses required in fulfillment of the engineering curricula. The registrar's records gave the student's standing in terms of letter grades which were transmuted into points upon the following basis. An A was valued at 3 points; a B was valued at 2 points; a C was valued at 1 point; a D was valued at 0 point; an E was valued at −1 point. Even though an E had been removed by repeating the course it was nevertheless given the value above indicated in computing the student's academic standing. After the average academic standings had been obtained they were arranged in order of their magnitude. Because of the limited number of graduate engineers and the necessity for making comparisons in terms of the percentage of each group checking an item, it was thought advisable to divide the group into two equal subgroups.

The Personal History Record Blank was filled out by each graduate engineer as a part of the regular routine of registering upon entrance to the University as a Freshman. This blank includes the 37 items from Miner's Blank for the Analysis of Work Interests. Instructions to the student in respect to these items were as follows:

> Notice the contrasts in working conditions listed below. See how they are related to your own interests and abilities. Wherever you can distinguish a difference in yourself, check that one in the pair under which you believe you would do the better work. Consider in which of the pair, after training, you would trust yourself more to meet the competition of others.

Inter-group comparisons were made in terms of the percentage differences in checking the contrasting interests and work conditions. These percentage differences were considered statistically reliable when the chances of their being real were 97 in 100 or above. The formula for obtaining the standard error of a proportion as given by Yule (3) was used in calculating the standard error of percentage differences. In summarizing the results that item in the pair of

contrasts for which a reliable difference was found is designated.

Summarizing the comparisons between the percentage of engineers who checked each item on the blank and the percentage of the random group of 570 University freshmen who checked that item in the same way, statistically reliable differences were obtained for the contrasts listed in Table I.

Summarizing the comparisons between the percentage of engineers who checked each item on the blank and the percentage of psychology students who checked that item in the same way, statistically reliable differences were obtained for the contrasts listed in Table II.

A limitation of this study, in respects to the comparisons between the upper and the lower fifty per cent of the engineers, is the exclusion of all of those individuals who failed to satisfactorily complete the engineering course. It is possible that they were unable to succeed not so much as a result of a lack of interest as from a lack of ability. A study of the intelligence test ratings of those who failed in comparison with those who succeeded would verify this hypothesis. Summarizing the comparisons between the upper fifty per cent of the engineers who checked each item on the blank and the lower fifty per cent of the same group who checked that item in the same way, statistically reliable differences were obtained for the contrasts listed in Table III.

SUMMARY AND CONCLUSIONS

Utilizing the items on Miner's Blank for the Analysis of Work Interests, differential choices in respect to these interests and work conditions were obtained in comparisons between[2] an occupational group of 60 graduate engineers and a random group of 570 University freshmen,[2] 60 graduate engineers and 250 general psychology students who had com-

[2] Miner, J. B., A Method for Evaluating a Psychograph for Vocational Guidance, Journal Ed. Psy., 1926, May, 331–340.

TABLE I

CONTRASTING ITEMS	PER CENT OF ENGINEERS CHECKING	PER CENT OF RANDOM GROUP CHECKING	CRITICAL RATIO
*( ) Public Service	65	48	2.70
( ) Private Service			
( ) Organizing People			
*( ) Constructing Things	88	48	8.89
( ) Working With Things			
*( ) Working With People	12	60	10.67
*( ) Operating Appliances	45	59	2.22
( ) Repairing Appliances			
( ) Doing the Same Thing			
*( ) Wide Variety in Work	85	76	2.00
( ) Influencing People Directly			
*( ) Influencing People Indirectly	58	37	4.67
( ) Work Requiring Inspiration			
*( ) Work Requiring Thoroughness	75	49	4.13
*( ) Making Things as Directed	70	30	6.35
( ) Following Your Own Methods			
*( ) Work Requiring Expression	27	47	3.18
( ) Work Requiring Computations			
*( ) Work Requiring Quick Results	63	41	3.49
( ) Work Requiring Perseverance			
*( ) Work In Office	55	38	2.70
( ) Work Requiring That You Teach			
*( ) Regular Time For Work	48	71	3.65
( ) Irregular Time for Work			
( ) Preparing Your Plans			
*( ) Carrying Out Your Plans	65	48	2.70
*( ) Work Requiring Judgment	82	66	3.56
( ) Work Requiring Industry			
( ) Work Requiring Sympathy			
*( ) Work Requiring Decision	70	54	2.54
( ) Work Requiring Accuracy			
*( ) Work Requiring Originality	60	39	3.33
*( ) Larger Future Success	38	75	5.87
( ) Smaller Immediate Success			
*( ) Work Requiring Artistic Taste	27	39	1.91
( ) Work Requiring Artistic Creation			

TABLE II

CONTRASTING ITEMS	PER CENT OF ENGINEERS CHECKING	PER CENT OF RANDOM GROUP CHECKING	CRITICAL RATIO
*( ) Indoor Work ( ) Outdoor Work	18	55	6.30
*( ) Influencing People Directly ( ) Influencing People Indirectly	17	46	5.22
*( ) Slow Movements ( ) Rapid Movements	17	29	2.00
*( ) Regular Time For Work ( ) Irregular Time For Work	48	69	3.00
*( ) Organizing People ( ) Constructing Things	2	53	14.20
*( ) Large Future Success ( ) Smaller Immediate Success	38	84	6.90
*( ) Work Requiring Expression ( ) Work Requiring Computation	27	71	6.97
*( ) Increasing the Amount of Production ( ) Improving the Quality of Protion	58	15	6.32
*( ) Working With Things ( ) Working With People	80	24	9.80
*( ) Work Requiring Quickness ( ) Work Requiring Reliability	58	22	5.29
*( ) Work In One Town ( ) Work Requiring Traveling	28	47	2.88
*( ) Making Things As Directed ( ) Following Own Methods	70	22	7.40
*( ) Work Requiring Artistic Taste ( ) Work Requiring Artistic Creation	27	49	3.30

pleted the beginning course, and,[3] the engineering graduates with superior achievement in required courses in contrast with those of inferior achievement.

Considering those differences to be statistically reliable when the chances of their being real were 97 in 100 or above,

[3] Yule, G. Udny, An Introduction to the Theory of Statistics: Chas. Griffin & Co. Ltd., London, 1911.

TABLE III

CONTRASTING ITEMS	PER CENT UPPER GROUP	PER CENT LOWER GROUP	CRITICAL RATIO
( ) Convincing People			
*( ) Investigation Work	43	70	2.25
( ) Working With Things			
*( ) Working With People	3	20	2.12
*( ) Working By Yourself	53	27	2.17
( ) Working With Others			
*( ) Operating Appliances	30	60	2.31
( ) Repairing Appliances			
*( ) Influencing People Directly	7	27	2.22
( ) Influencing People Indirectly			
*( ) Work In Office	40	70	2.50
( ) Work Requiring That You Teach			
*( ) Work Requiring Judgment	70	93	2.56
( ) Work Requiring Industry			
( ) Welfare Work			
*( ) Taking Part in Entertainments	23	47	2.00
( ) Increasing the Amount Production			
*( ) Improving Quality of Product	60	40	2.22

eighteen items served to differentiate the graduate engineers from the random group. Similarly, thirteen items differentiated the psychology student group from the graduate engineers. When comparisons were made between the graduate engineers with superior academic achievement and those with inferior achievement, nine of the items served to differentiate them.

These results are interpreted as indicative of not only the significance of interests and preferred work conditions as they bear upon the problem of guidance in the selection of courses, but also the extent to which they may be, together with general ability, determinative factors in academic adjustment.

THE RELATION BETWEEN ANTHROPOMETRIC MEASURES AND MANUAL DEXTERITY[1]

C. H. GRIFFITTS
University of Michigan

PURPOSE

THE purpose of this report is to give the results of a study of the relationships, if any, between height, weight, hand measurements, and various ratios on the one hand, and scores in a group of "motor" tests on the other. This study was made for two reasons: (1) interest in the general problem of typology, and (2) because the writer frequently has been asked whether there is any relation between the size of the body or of the hand and manual dexterity, or between body-build and eye-hand coordination.

THEORETICAL BACKGROUND

Among psychologists, psychiatrists, physical educators, and others there seems to be a renewed interest in constitutional or bodily types. Physicians, of course, have for more than two thousand years believed that there was some connection between body-type and predisposition to certain diseases. There was and is a belief that the body-type of an individual is related to his mental life, and especially to the temperaments and mental disorders. Kretschmer's work is to some degree a symptom, but to a larger degree a cause of this renewed interest. That there is some truth back of this age-old belief, few will deny. That most of the type-classifications are arbitrary, artificial, and far-fetched, few who have examined them critically will deny. Our problem today is to discover the truth with regard to the existence of such types,

[1] This and two earlier articles by the same author (see references at the end of this article) are partial reports of a study made possible by a grant from the Faculty Research Fund of the University of Michigan.

or at least to discover whether a body-type is just a body-type, or whether it is associated with certain intellectual, emotional, temperamental, and neuromuscular traits. It is true that so far most investigations of the relation between the so-called "physical" traits and the so-called "mental" traits have failed to substantiate these popular notions. Yet not all of the results have been negative. Whether or not we accept Kretschmer's data at their face value, the fact remains that other investigators have reported results that tend to substantiate Kretschmer's.

There are theoretical reasons for believing that there are likely to be interrelationships between morphological differences and differences in neuromuscular activity. For example, it is evident that the bodily proportions are influenced very largely by the secretions of some of the endocrine glands. It is also evident that various aspects of mental and neuromuscular activity are influenced by these same secretions. The wide-spread influence of thyrine will perhaps serve as an example of something which affects not only the bodily proportions, but also intelligence, temperament, and neuromuscular activity. This association of traits will of course be found only when a condition of under-activity, for example, is present during the growth period. If it appears after maturity, the bone-measurements will not be affected, but the mental and neuromuscular activity will be.

Previously I have found and reported (2) evidence that the human hand is remarkably sensitive to some, at least, of the developmental factors which have influenced the development of the body as a whole. Using data secured from a group of sixty university students in good health, it was found that the width of the hand measured across the knuckles showed a higher correlation with weight than the correlation between height and weight. This is rather remarkable in view of the fact that the hand itself contributes but little to the total weight of the body. The correlation between the width of the hand and weight is .68, and the correlation between the prod-

uct of the width times the length of the hand and weight is .74. The correlation between the length of the hand and height is .69, and between the length of the middle finger and height is .58. I have noticed that a certain type of tapering hand usually belongs to a person who is likely to be taller than the average and overweight, the excess weight being due to a wide distribution over the body of what appears to be soft fat.

In view of these facts the question naturally arose as to whether the speed and control of hand-movements are influenced by some of the factors which have influenced the growth of the body. Sluggish and clumsy movements must be the result in part of something in the nature of a chemical factor; and it is theoretically possible that such a factor has also influenced the size or relative proportions of the body or of some part of it. This study was undertaken in an effort to discover whether or not there is any such relation between any of these anthropometric measures and manual dexterity.

SUBJECTS

The subjects were sixty young men, all of whom were in good health. Most of them were sophomores. There were no freshmen. The oldest was twenty-five, the next oldest twenty-three, and the youngest was not quite eighteen. They were an unselected group except for restrictions with regard to age and poor health. None of them were excessively obese.

Means and standard deviations for age, height, weight, height-weight ratio, and weight/height^2 index (weight divided by the square of the height) are shown in Table I. So far as height and weight are concerned, a comparison of the means and standard deviations for my group with the means and standard deviations of 868,445 men in the army draft shows that my group was a good sample. The majority of the men in the army draft were young men.

Davenport (1) gives a table for classifying men according to the weight/height^2 index. Part of this table is shown in

TABLE I

Means, Standard Deviations, and Ranges

	AGE* YEARS	MICHIGAN GROUP				ARMY DRAFT**	
		Height Inches	Weight Pounds	Height / Weight	Weight / Height³ Metric	Height	Weight
Mean	19.75	69.8	151.8	.466	2.19	67.5	141.5
S.D.	1.48	2.5	17.3	.050	.23	2.7	17.4
Range	17–25	65–75	115–186	.39–.58	1.8–2.7		

* The age recorded for each subject was his age at his last birthday.

** Height and weight without clothes. Add about 1 inch to height and about 6 pounds for clothes to make values comparable to those for the Michigan students.

Table II, along with the distribution of "body-builds" in my group of young men. It might at first appear from a study of this table that my group of young men were not a good sample as to build. But it is probable that they were a rather good sample of *young* men. Davenport used data from a number of much older men. In a study of this kind it is safer to restrict the age-range.

TABLE II

Distribution of Body-builds

CLASSES OF BUILD* (DAVENPORT)		DISTRIBUTION MICHIGAN STUDENTS
Index	Build	
1.40 to 1.80	Very slender	2
1.81 to 2.14	Slender	23
2.15 to 2.56	Medium	32
2.57 to 3.05	Fleshy	3
3.06 to 4.50	Very fleshy	0

* Davenport's classes are for adults, both sexes.

MEASURES AND TESTS

The following anthropometric measurements were made:

Height (Ht) with shoes.
Weight (Wt) with coat off and other clothes on.

Width of the hand (HW), measured across the knuckles with the fingers close together and bent backwards as far as possible, to make the hand rigid.
Length of the hand (HL), measured from the middle crease at the proximal end of the palm to the end of the middle finger.
Length of the finger (FL), measured from the palm side of the crease at the base of the middle finger.
Palm length (PL), measured between the two "landmarks" just mentioned.

Various ratios which appear in Table III were computed from these measures. It will be noticed that there has been some deviation from measurements that a person would be likely to make on a bony skeleton.

The following tests were given:

MacQuarrie Test of Mechanical Ability.
Part 1 (M1).
Part 2 (M2).
Part 3 (M3).
Sum of parts 1, 2, and 3, entered as (M9).
Free tapping (Tf), with brass plate and metal stylus.
Tapping, "back and forth" (Tbf), on cross-ruled paper, eight lines to the inch.
Matchboard (Mb) Nails instead of matches.
Steadiness (St).
Aiming at holes (A–H).
Aiming at crosses (A–C).
Groove test (Gr).
Scales test (Sc).

A detailed description of these tests and of the procedures followed may be found in a previous report (3). It is obvious that a person with very large hands and fingers would be at a disadvantage in such a task as holding a very small screw between finger and thumb and inserting it far back in a small space. But although that sort of thing may be important in some practical situations, it is not present to any large degree in any of the above tests. It was purposely excluded.

RESULTS

The relation between body-build and dexterity.—An inspection of the correlations in Table III show quite definitely that scores in the tests show practically no correlation with height, weight, or height/weight ratios. Correlations were also computed between test-scores and another frequently used index of build, obtained by dividing weight by the square of the height, using metric measures. These correlations, like the others, were all close to zero.

The lack of correlation is not due to low reliability of the tests. The combined scores for work on two days were used in computing the coefficients. By applying the Spearman-Brown formula to the correlations between the scores for the first and second days, the probable reliability of the combined scores was obtained. These values range from .73 for test M1 to .91 for M2 and Aiming at Crosses (A–C), with an average value of .85.

The relation between hand-measurement and dexterity.—The correlations between test scores and various hand-measurements and ratios are shown in Table III. These are all very low. Only two are above .30. One of these is – .37, between Mb and PL; the other, – .34, between Mb and HL. The probable error of each of these coefficients is .07, so that one of these coefficients is more than five times its probable error, and the other more than four times its probable error. These coefficients may therefore have some statistical significance. The probable errors of all other coefficients shown in Table III are from .09 for a coefficient of .00 to .08 for a coefficient of .30.

Because the nails used in the Matchboard test were fairly close together, a person might predict that width measurements would show greater negative correlation, if any, with the scores in the test than length measurements would show. However, the evidence is to the contrary. It is unfortunate that width measurements of the fingers were not made. However, it is probable that width of the fingers would show a

TABLE III

Correlations between anthropometric measures and right-hand scores in various tests

	HL	HW	$\frac{HL}{\times HW}$	$\frac{HW}{HL}$	FL	$\frac{FL}{HL}$	PL	$\frac{FL}{PL}$	Ht.	Wt.	$\frac{Ht.}{Wt.}$	Str.
M1	−.10	.14	.09	.23	−.24	−.20	.05	−.19	−.11	.08	−.13	.12
M2	−.06	.05	.02	.08	−.05	−.03	−.04	.02	.04	−.01	.04	−.05
M3	−.27	−.02	−.14	.14	−.02	.24	−.33	.23	−.14	.01	.01	.04
M9	−.16	.06	−.01	.26	−.16	−.07	−.10	−.01	−.07	.04	−.05	.06
Tf	−.01	.11	.08	.11	.17	.25	−.15	.24	.08	.00	−.02	.02
Tbf	−.21	−.21	−.23	−.09	−.16	.05	−.16	.00	−.04	−.08	.14	−.12
Mb	−.34	−.15	−.24	.08	−.13	.22	−.37	.20	−.15	−.15	.15	−.18
St	−.16	−.20	−.17	−.13	−.12	.01	−.12	.00	−.19	−.12	.09	−.04
A–H	−.04	−.05	−.01	−.02	−.04	−.01	−.02	−.02	−.11	.12	−.14	.21
A–C**	−.10	−.03	−.07	.04	−.10	−.02	−.06	.00	−.18	.03	−.07	.01
Gr**	−.20	−.15	−.16	−.04	−.25	−.08	−.07	−.11	−.13	−.11	.10	−.12
Sc**	−.03	−.03	.01	.04	−.04	.01	−.01	−.01	−.04	.06	−.09	.28

* For the meaning of abbreviations see the list of measures and tests.

** The scores in A–C, Gr and Sc were "error scores." Because such scores are inversely related to ability the signs of the coefficients were changed when scores in one of these tests were involved.

higher correlation with the width of the hand than with the length of the hand; and it may be seen from the values shown in Table III that the width of the hand, either absolute or relative, has very little if any relation to the scores in the Matchboard test. In view of these facts, along with the additional fact that the correlation between the scores in this test and weight is so low, it becomes possible that there is something in the physiology of the person with long hands that handicaps him somewhat in this test. If the handicap were purely anatomical it is likely that width would exert a greater influence than length.

In drawing conclusions from the correlations shown in Table III, we should remember that the scores in the tests represent performances of subjects who had not had previous practice in the tests. Although these subjects were given several trials with each test on each of two days, and although in some of the tests there was a marked increase in scores from the beginning to the close of the work, it is still true that daily work on the tests for a month or two would have shown continued improvement for the group as a whole, and unequal improvement for different individuals. There is a possibility that a definite relation between body-build and test-performance would have appeared if work on the tests had continued until every subject had reached the physiological limit. Individual differences in initial scores in these tests must depend a great deal upon differences in the previous use of the hands and arms; and insofar as this is true the correlations shown in such a table as Table III would be reduced.

The low value of most of the coefficients shown in Table III may be the result of any one or more of a number of situations, including: (a) the absence of any real relationships; (b) the failure of the tests and measures to tap the significant qualities; (3) inadequate statistical procedures; (d) the number and complexity of factors which influence any trait or quality; (e) differences in the amount and kind of hand work done by the subjects; (f) the existence in some individuals of some

unusual condition during the growth period only, leaving lasting effects on morphological traits but not on functional traits; and (g) the existence in some individuals of normal conditions during the growth period, followed by abnormal conditions which influence test performances but not anatomical measures.

It appears to the writer that the next step should be an experiment similar to this, but one in which practice is continued until no further improvement would be likely.

SUMMARY

(1) The results of this study show that within a group of young men there is but little if any relationship between scores in tests of motor abilities and anthropometric measures and proportions. Most of the correlations are low. Two correlations in which the Matchboard test is involved are four and five times their probable errors.

(2) It is possible that higher correlations would be found if a group of subjects were required to practice on the tests until they had reached their upper limit. Other possible explanations for the low correlations are mentioned.

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STANFORD-BINET IQ CHANGES IN THE HARVARD GROWTH STUDY

EDWARD A. LINCOLN
Harvard University

DURING the first seven years of the Harvard Growth Study about 1,200 children were given two or more Stanford-Binet intelligence examinations. With these data it is possible to study in a number of ways the IQ changes of various groups and the influence of various factors upon IQ constancy. Several important investigations have already been made by Dr. Psyche Cattell, and two of these have been published under the titles, *Constant Changes in the Stanford-Binet IQ*,[1] and, *Do the Stanford-Binet IQ's of Superior Boys and Girls Tend to Decrease or Increase with Age?*[2]

Unfortunately, the data do not furnish a completely representative sampling from a normal or average group. Because of the lack of sufficient funds it was not possible to give individual tests annually to all the Growth Study subjects. In fact, in only one year during the progress of the Study was it possible to examine practically all the children. Often the individual tests were used when a child had widely varying results on two group tests, or when the teachers asked for special help with problem children. Disproportionate numbers of examinations were given to superior children because of the establishment of special classes for the gifted in one of the communities. These factors of selection gave a group which might be expected to vary more than the average. On the other hand, it may be supposed that this group is very much like a group which would be examined individually in a large school system over a number of years. There also such a group would consist of pupils who had shown inconsistencies, problem cases, and children selected for special purposes.

[1] *Journal of Educational Psychology*, Vol. XXII, No. 7, October, 1931, p. 544.

[2] *Journal of Educational Research*, Vol. XXVI, No. 9, May, 1933, p. 3.

For the present study all available IQ differences were computed and used. When only two tests had been given, there was only one difference. If three tests were given, however, there were three differencs, 1–2, 1–3, and 2–3. When four tests were available, there were six differences, and so on. In each instance the earlier test of the two being compared was taken as the zero point and the differences were computed as gains or losses from this point. This again represents what is done in the ordinary school or institution. The first obtained IQ is recorded and subsequent IQ differences are regarded as changes from the first. Computed in this way there were obtained 1,804 differences for the boys and 1,645 differences for the girls. The results for the two sexes were separated because previous studies have indicated that real sex differences may exist.

The differences have been distributed in two ways. First, a study has been made of the differences in relation to the interval between the two Stanford-Binet examinations. Second, the differences have been distributed on the basis of the IQ classification of the pupil on the earlier test as Very Superior, Superior, Average, Inferior and Very Inferior.

In Table I are shown the data for the changes in relation to the interval between the tests. Yearly intervals have been used, and the range is from less than one year to seven years. Only a few cases were available in the latter group but they are included with the others.[3]

The median differences for the boys and girls are respectively 7.35 and 7.17 IQ points. There is no sex difference here. However, there appears a slight difference when we look at the losses and gains separately. For the boys, 52.7 per cent of the changes were gains, with a median of 8.53 points, and 43.3 per cent were losses with a median of 6.85 points. Among the girls the figures are 48.3 per cent gains with a median of 7.92 points, and 47.3 per cent losses with a median of 7.13

[3] In the last six years of the Study other examinations were given, so that later reports will give more conclusive evidence about the differences over the seven-year and longer intervals.

TABLE I

Changes in Relation to Interval between the Tests

	BOYS				GIRLS			
	N	Per cent	Md.	Q	N	Per cent	Md.	Q
			0–11 months' interval					
Gains	146	52.7	7.40	4.50	127	53.2	7.55	4.41
Losses	121	43.7	5.64	3.40	100	41.8	6.36	2.71
Total	277*		6.30	4.00	239*		6.64	3.19
			12–23 months' interval					
Gains	193	51.5	7.90	4.40	155	49.2	7.10	4.02
Losses	165	44.0	6.29	3.00	144	45.7	6.33	3.28
Total	375		6.69	3.87	315		6.33	3.74
			24–35 months' interval					
Gains	144	54.2	8.02	4.70	120	50.5	7.56	4.17
Losses	115	43.2	6.49	4.01	106	44.5	7.10	3.46
Total	266		7.13	4.43	238		6.99	3.84
			36–47 months' interval					
Gains	178	52.8	8.87	5.04	154	43.1	8.50	4.56
Losses	146	43.3	7.32	3.55	191	53.5	7.64	3.76
Total	337		7.68	4.52	357		7.75	4.18
			48–59 months' interval					
Gains	96	59.2	9.72	3.92	65	48.8	9.13	6.85
Losses	62	38.3	7.00	4.12	62	46.7	8.75	3.64
Total	162		8.57	4.28	133		8.58	4.62
			60–71 months' interval					
Gains	164	48.7	9.70	6.20	142	46.6	8.03	4.58
Losses	154	45.7	7.64	4.14	150	49.2	7.02	3.85
Total	337		7.88	5.22	305		7.09	4.24
			72–83 months' interval					
Gains	26	60.4	10.00	5.77	27	52.9	10.42	6.64
Losses	14	32.6	11.00	5.00	23	45.1	7.81	4.73
Total	43		9.77	6.19	51		8.75	5.43
			84–95 months' interval					
Gains	3	42.9	7.50	4.13	5	71.4	12.50	9.17
Losses	4	57.1	15.00	5.00	2	28.6	5.00	2.75
Total	7		11.25	4.69	7		7.50	8.65
			All Cases Combined					
Gains	950	52.7	8.53	4.88	795	48.3	7.92	4.50
Losses	781	43.3	6.85	3.73	778	47.3	7.13	3.62
Total	1,804		7.35	4.49	1,645		7.17	4.11

* Each total contains, in addition to the gains and losses, the number of pupils who made no change.

points. That is, the boys gain more often than the girls and their gains are larger, while the girls lose more often than the boys and their losses are slightly more substantial. These differences are interesting statistically, but it is doubtful whether they have any practical significance.[4]

An examination of the table will show that as the interval increases, there is a tendency for the differences to become slightly larger. In the first group where the two tests were given within one year, the median differences for the boys and girls are 6.30 and 6.64 points. In the six-year-interval group the corresponding medians are 9.77 and 8.75 points. All through the table there appears the sex difference already noted. That is, the boys gain somewhat more frequently and more substantially than the girls.

In practically every interval the gains are more frequent than the losses for both boys and girls. This is uniformly true for the boys except in the seven-year group which is too small to be of significance. There are also exceptions in the three-year and five-year groups of girls.

In variability there is a gradual increase as the interval becomes longer. In the group retested in less than one year, the quartile deviations are 4.00 and 3.19 for the boys and girls respectively, while in the six-year group the corresponding quartile deviations are 6.19 and 5.43 points. Except in the five-year group, the boys' variability is always somewhat larger than the corresponding variability of the girls. It is also worthy of note that the variability among the pupils who gain is slightly greater than the variability among those who lose.

In Table II are presented the results of the study of changes in relation to IQ level. For this study five IQ groups were made: 120 and over, 110–119, 90–109, 80–89, and below 80. Each of these groups has a sufficient number of cases to give dependable results, as the numbers range from 782 to 133.

[4] Lincoln, E. A., *The Insignificance of Significant Differences. Journal of Experimental Education*, Vol. II, No. 3, March, 1934, pp. 288–290.

TABLE II

Changes in Relation to IQ Level on the Earlier of Two Tests

	BOYS				GIRLS			
	N	Per cent	Md.	Q	N	Per cent	Md.	Q
			IQ 120 and over					
Gains	151	46.4	9.69	4.57	88	41.5	8.33	6.15
Losses	165	50.8	9.05	5.19	115	54.2	9.10	4.68
Total	325*		9.09	4.95	212*		8.41	5.23
			IQ 110–119					
Gains	146	52.9	11.21	5.91	155	50.0	8.59	5.24
Losses	120	43.5	7.33	3.75	144	46.5	6.51	3.91
Total	276		8.65	5.15	310		7.69	4.65
			IQ 90–109 (Av.)					
Gains	404	52.5	8.08	5.18	408	52.2	8.00	4.38
Losses	333	43.3	6.81	3.38	339	43.3	7.31	3.43
Total	769		7.08	4.58	782		7.32	4.22
			IQ 80–89					
Gains	124	52.1	7.69	4.04	89	52.9	6.95	3.69
Losses	99	41.6	4.96	2.85	110	42.8	6.59	3.16
Total	238		5.92	4.00	208		6.44	3.34
			IQ below 80					
Gains	125	63.8	7.32	3.96	55	41.3	6.62	3.82
Losses	64	32.6	4.61	2.71	70	52.6	5.54	2.24
Total	196		6.05	3.43	133		5.50	3.04
			Combined Groups					
Gains	950	52.7	8.53	4.88	795	48.3	7.92	4.50
Losses	781	43.3	6.85	3.73	778	47.3	7.13	3.62
Total	1,804		7.35	4.49	1,645		7.17	4.11

* Each total includes, in addition to the gains and losses, the number of pupils who made no change.

An examination of this table reveals a tendency for the IQ differences to decrease slightly, on the average, from the higher levels to the lower. In the very superior group the median of the differences for the boys is 9.09 points, while that for the girls is 8.41 points. In the very inferior group the corresponding medians are 6.05 and 5.50 points, respectively. It is also worthy of note that the quartile deviations show a consistent decreasing trend along with the medians. These two sets of

facts taken together indicate that the very inferior children were the most consistent and the very superior pupils were the least consistent of the Growth Study cases.

In the very superior group the percentage of losses is greater than the percentage of gains while in all other IQ groups the gains form a larger percentage of the changes than do the losses. The results in the very superior group are probably to be explained as a result of the regression effect which must be presumed to be present when children are classified on the basis of the initial IQ. However, the same effect should be expected in the 110–119 group, where it does not appear. The reason for this inconsistency is not apparent in the data.

The sex differences already noted, namely, that the boys gain more often and more substantially than the girls, while the girls lose more often and more substantially than the boys, are found at practically all IQ levels. The only exception to this general tendency is found in the 110–119 group, where the girls' median loss is 0.82 less than the boys' median loss. Apparently this sex difference is a real one, but a special study of these and other data is being undertaken to get further evidence on this point. It seems probable that the differences are not of any practical significance, although they may be statistically significant.

SUMMARY

1. This study deals with the IQ changes of some 1,200 children who were given two or more Stanford-Binet examinations during the first seven years of the Harvard Growth Study. The data consist of 1,804 IQ changes for boys and 1,645 IQ changes for girls.

2. When all cases are combined there is a median difference of slightly over 7 IQ points, with a quartile deviation of somewhat more than 4 points.

3. There is a slight increase in the size of the difference and in the variability of the differences as the interval between tests increases from less than one year to six years.

4. There is a tendency for the boys to gain more often and to make larger gains than the girls.

5. When the results are separated according to IQ levels, there is a steady increase in the size of the median difference from the Very Inferior to the Very Superior group.

6. A similar increase in variability is present.

7. The implications of (5) and (6) are that the Very Inferior (IQ below 80) are most consistent and the Very Superior (IQ 120 or over) are the least consistent.

8. The sex difference mentioned in (4) persists at all IQ levels, but probably has no practical significance.

A COMPARISON OF THE CARDIO-PNEUMO-PSYCHOGRAPH AND ASSOCIATION METHODS IN THE DETECTION OF LYING IN CASES OF THEFT AMONG COLLEGE STUDENTS.

JOHN E. WINTER
West Virginia University

THE PROBLEM

THE occasion for this experiment was a practical situation that developed in one of our women's dormitories. Clothing, toilet articles and money had been disappearing at irregular intervals. The department of psychology was asked to apply its laboratory technique to the detection of the guilty party or parties. No one was compelled to take the tests, but every girl in the dormitory did so.

APPARATUS

Two types of tests were used:

1. An association test, which was a modification of Jung's association test to suit the situation. Dunlap's chronoscope was used in calculating the reaction time.
2. The Cardio-Pneumo-Psychograph test. In this test we used an ordinary pneumograph, a Baumanometer, an improved form of the Erlanger capsule for high and low air pressure, and a McKenzie polygraph for a continuous record of breathing and heart action.

For the purpose of brevity we shall not enter into a discussion of the relative merits of different types of instruments, nor what the exact nature of the factor is that we are measuring in the second test, whether this be systolic, diastolic, pulse or lateral blood pressure. In general we followed the method employed by Dr. J. Larson in his work at Berkeley and Chicago.

In each case we secured a normal or practice curve before the questioning started as a basis of comparison in evaluating the individual's record during questioning.

DISCUSSION

The following tables give a summary of the data obtained in the tests. Twenty-five students were tested but the tables contain the data on only eleven cases. The eleven cases here recorded are arranged in the order of their apparent guilt, the first case being the least guilty and the last case the most guilty. The reason for omitting the other fourteen cases is that none of them showed any more significance than the first few cases reported in the tables.

In each of the three factors tested, namely, breathing, blood pressure and association, a scale of values was adopted to indicate the significance of the respective tests. Three figures

TABLE I
Breathing

CASE	PRACTICE				QUESTION				SIGNIFICANCE		
	Reg.	Irreg.	Light	Deep	Reg.	Irreg.	Light	Deep	0	1	2
1	x		x		x		x		x		
2	x		x		x		x		x		
3	x		x		x		x		x		
4	x		x		x		x		x		
5		x	x		x		x		x		
6	x		x		x		x		x		
7	x		x		x		x		x		
8		x	x			x	x			x	
8	x		x		x		x		x		
9	x		x		x		x		x		
9	x		x		x		x		x		
10	x		x		x		x		x		
10	x			x	x			x	x		
11	x		x		x		x		x		
11	x			x	x			x	x		
11	x		x		x		x		x		

represent these values, 0, 1 and 2. A value of 0 indicates that the test has no significance, that is, there is nothing to indicate possible guilt. A value of 1 indicates some significance and points in the direction of guilt. A value of 2 indicates distinct signs of guilt.

TABLE I. BREATHING

In the breathing test four criteria were used. The breathing curve was rated as regular or irregular; light or deep. Table I shows that the factor of breathing is negligible throughout the experiment. The guilty person (No. 11) in three successive tests showed a value of 0 in all three. One case (8) showed a value of 1, while not a single case showed a value of 2. Case 8 on being retested showed a value of 0.

TABLE II. BLOOD PRESSURE

The blood pressure curve was rated as regular or irregular, and as medium or strong. Three cases showed a value of 1,

TABLE II
Blood Pressure

CASE	PRACTICE				QUESTION				SIGNIFICANCE		
	Reg.	Irreg.	Med.	Str.	Reg.	Irreg.	Med.	Str.	0	1	2
1		x	x		x		x		x		
2	x		x		x		x		x		
3	x			x	x			x	x		
4	x		x		x		x		x		
5	x		x		x		x		x		
6	x		x		x		x		x		
7	x		x		x		x		x		
8	x			x	x			x	x		
8	x			x	x			x	x		
9		x	x			x	x			x	
9		x	x		x		x		x		
10		x	x			x	x			x	
10	x		x		x		x		x		
11		x		x		x		x			x
11		x	x			x	x			x	
11	x		x		x		x				x

but in the first two cases a retest showed a value of 0. Case No. 11 was the only one to attain a value of 2, and was tested three times. The first record showed a value of 2, strongly indicating guilt, and was accompanied by a guilty association record. The second record showed a value of 1. This student was thoroughly questioned and shown her record, with the result that she confessed to theft. Her third record was a typical confession record, regular breathing and steady heart. It was therefore given a value of 2.

TABLE III. ASSOCIATION

In the association experiment the following criteria were used to gauge the relative significance of reaction times:

(a) No association was considered significant unless its reaction time was at least twice the median reaction time for that particular individual. The reaction times recorded in Table III are in terms of tenths of a second.

(b) Significant associations were rated as guilty only when they represented responses to "guilty" stimulus words, or responses to stimulus words immediately following "guilty" stimulus words. Scattered associations with high reaction times were not considered significant.

(c) 1 to 3 guilty reactions were given a value of 0.
4 to 8 guilty reactions were given a value of 1.
9 or more guilty reactions were given a value of 2.

Table III shows that there were five cases receiving a value of 1, and one with a value of 2 (No. 10). This would seem to indicate that No. 10 was guilty. However, three factors tend to throw doubt on this decision.

(a) The breathing records of this girl show a value of 0.

(b) The first blood pressure test shows a value of 1, but the retest shows a value of 0.

(c) Further investigation of the reaction words of case 10 showed that the high reaction might have been caused by circumstances unrelated to the crime in question. This girl had been involved in various student esca-

pades, and had previously been guilty of lying. It developed that she was now afraid, not of legal consequences, but of the wrath of her parents.

TABLE III
Association

CASE	MEDIAN	HIGH	GUILTY	FOLL.		SIGNIFICANCE		
	Reac.	Reac.	W'ds.	Guilt.	Scat.	0	1	2
1	11	2	1	0	1	x		
2	12	1	1	0	0	x		
3	8	1	1	0	0	x		
4	9	3	2	1	0	x		
5	12	7	4	2	1		x	
6	9.5	4	3	1	0		x	
7	12	6	4	2	0		x	
8	20	8	6	0	2		x	
8								
9	10	5	3	0	2	x		
9								
10	9	14	8	5	1			x
10								
11	7	7	2	2	3		x	
11								
11								

With the possible elimination of No. 10 we are led to the conclusion that No. 11 with a significance of 1 in association, and a significance of 2, 1, and 2, respectively, in blood pressure, is the guilty person. This conclusion is in agreement with the girl's confession of guilt.

The results of these tests indicate that the blood pressure test is superior to the association test in the detection of guilt. The association test of No. 10 introduces into the procedure a factor that tends to compromise the validity of this type of test. In challenging the individual to think of something besides the stimulus word the association test permits the introduction of extraneous and unrelated elements. In the blood pressure test there is a greater tendency for the subject to

TABLE IV
Summary

CASE	0			1			2		
	BR.	B.P.	AS.	BR.	B.P.	AS.	BR.	B.P.	AS.
1	x	x	x						
2	x	x	x						
3	x	x	x						
4	x	x	x						
5	x	x				x			
6	x	x				x			
7	x	x				x			
8		x		x		x			
8	x	x							
9	x		x		x				
9	x	x							
10	x				x				x
10	x	x							
11	x					x		x	
11	x				x				
11	x							x	

keep his attention fixed on the single idea presented in each successive question.

SUMMARY

A comparison of the results of the foregoing tests leads to the following conclusions:

1. Breathing proved to be of little or no significance as a criterion of guilt.

2. On the whole the Cardio-Pneumo-Psychograph test was more reliable than the association test.

3. A combination of both types of tests is more reliable than either one separately.

4. The fact that in the case of both types of tests an occasional innocent person showed even moderate symptoms of guilt indicates the hazard in trusting too implicitly in the results of these tests.

SOME OBSERVATIONS ON LARGE-SCALE TESTING

GARRET L. BERGEN
New York State Employment Service

THE Adjustment Service experiment convinced those of us who were privileged to participate in it that psychological testing contributed a valuable and necessary technique to the process of securing sufficient information about adult clients before counseling them.

The set-up and methods which were used by the Adjustment Service are covered thoroughly by the first report of its work.[1] In general, the Adjustment Service was set up to help people to adjust themselves to a changing society. This process of general counseling sought to give the client a better understanding of his previous experience and personal characteristics, and to provide resources of information about available vocational, educational, or avocational opportunities which were appropriate to his interests and abilities. The task of the counselor was to bring together and interpret all this information and to assist the client in formulating a plan to take advantage of it.

Some clients came to the Adjustment Service of their own accord; others were referred by various community agencies. After registration at the Service complete records were secured of their educational, occupational, avocational and personal histories. A talk with the Registrar suggested the type of problem. Then came an interview with the counselor, who decided what diagnostic services were required. This was followed by psychological tests, medical and psychiatric examination when advisable, and the gathering of social case information when this existed. The counselor, after study of these data, discussed and weighed with the client the pertinent

[1] Bentley, Jerome H., "The Adjustment Service," American Association for Adult Education, 60 East 42nd Street, New York City.

factors in the case and a plan was formulated to meet the needs of the individual. Test results were only part, but a useful part, of the data upon which the counselor based his diagnosis.

In 15 months of operation, the Testing Department of the Adjustment Service administered batteries of four to eighteen tests to more than 12,000 people. During the busiest eight months the average daily load was 45 people. In one of the busiest months, 1,213 persons were tested, and on the busiest day tests were given to 68 people. Approximately 75,000 different test units were administered during the period of operation. The examining staff consisted of ten individuals.

This, briefly, was the extent of Adjustment Service testing. It was to be expected that an experiment of this magnitude, with so many tests given to so many people, would emphasize a number of problems—not new problems necessarily, but questions which can easily lie dormant until their very scope forces us to become more acutely aware of them.

For some of these questions we were able to find reasonably satisfactory answers. In other instances, we progressed only one or two steps toward solutions. There were many problems which we could not even begin to solve in the short time, and without funds at our disposal for research.

This paper presents, as a matter of record, a few of the more provocative of these problems—not necessarily major questions, but ones which are provocative from the point of view of interest. No attempt has been made to make rhyme or reason out of the relationship each bears to the other. These are merely random observations concerning a few of the problems confronting a counseling service using technical diagnostic measures.

Starting at the very threshold of the testing process, we encounter the establishment of "rapport" between examiner and examinee, a matter of considerable importance and one which merits more attention than usually given it. It is recognized that examinees should have a proper attitude

toward taking psychological tests. If a person is emotionally upset, tests will not provide an accurate measure of his ability. This consideration is not nearly so important in school testing, since the barrage of tests to which students in many modern schools have been exposed by embryonic Ph.D.'s has rendered them "test conscious." The Adjustment Service situation differed appreciably, as most of the clients were unemployed adults who had been away from the school situation from one to forty years. Therefore it was important to make certain that satisfactory rapport was established and maintained during tests. The major responsibility for this preparation rested with the counselor who was the focal point in the Adjustment Service set-up. It was he who decided whether or not tests might help clarify the client's picture, and if so, selected those tests which he believed most appropriate. Moreover, it was to the counselor that the client returned to discuss the test results and map out a program.

The following suggestion on the subject appears in the Adjustment Service "Manual of Counselors' Procedure":[2] "Since data obtained from tense or indifferent examinees are unreliable, the counselor stimulates the client's desire to do his best, but removes any fear he may have of the results. The counselor accepts full responsibility for 'gaining rapport' at this stage. He describes the kinds of tests the client is likely to encounter in the examining room. He explains that the tests are only one part of the total process but that they will enable the counselor to see certain aspects of his problem which cannot be approached in any other way. He makes clear to the client that there is no question of 'passing' any of these tests, and that he will probably do better on some than on others. He may even suggest to the client that the tests are really good fun and that he is likely to enjoy taking them. The counselor does not schedule tests unless he is

[2] Bergen, G. L., and Ward, R. S., "Registration and Counseling Procedure in the Adjustment Service." American Association of Adult Education, New York City.

reasonalby sure that the client is in a cooperative state of mind."

Under ideal circumstances this preliminary preparation might be sufficient. In many cases, however, it was found that additional effort to establish rapport was necessary, and the responsibility for this rested with the Testing Department examiners.

And here we encounter a point which I think merits serious consideration. The examiner could not infringe on the counselor's functions through excessive friendliness and interest, or the display of a knowledge which might lead the client to believe him better able to solve his problem than his counselor. There was danger in the examiner fostering what we came to call "over-rapport"—"over" for his particular function in the process.

Although the examiner was not expected to touch upon emotional disturbances of the client except those created by the testing situation, it was frequently difficult to limit the examiner-examinee relationship as neatly as this. This examiner was placed in the rather delicate position of establishing only that degree of rapport with the client which would create the most favorable atmosphere for testing, and at the same time controlling the rapport in order that the client's confidence centered around his counselor. This is no easy task. We have still a long way to go before we can even define, to say nothing of control, the degree of rapport which should be established by a test examiner, as differing from that rapport which the counselor develops, which is still different from the rapport which the psychiatrist must establish.

However, let us assume that we have established satisfactory rapport with Joe Client and are administering tests to him. These are standardized tests, for the most part, given standardized administration under so-called controlled conditions. The Adjustment Service held to these standards reasonably well. Perhaps we need not question the administration of these tests? I am not so sure. There are at least three signi-

ficant points of inquiry. In the first place, what do we know about ideal testing conditions and their control? We must experiment with tests under different conditions before we can justify our use of an instrument which was standardized under one set of circumstances, in an entirely different testing situation. Does the test's reliability change with different conditions? Can the same norms be used? Is it not possible that while some tests require individualized administration, in the case of other tests group usage is not merely possible but *desirable?* Does the order in which a battery of tests is given affect the results? These are the kinds of questions which must be answered. A bureau like the Adjustment Service, serving large numbers of individuals, offers us an opportunity to conduct such an investigation. Unfortunately lack of funds at the New York Adjustment Service prevented any attempt at such an investigation.

A second need for inquiry is brought clearly home by large scale testing when tests must be administered by a number of different examiners in a single organization, although the problem is equally acute as it pertains to examiners in *different* laboratories using the same tests. Granted that all examiners receive the same thorough training in fundamentals and in the details of administration, there are still subtleties and nuances of inflection, ways of answering examinees' questions, and a myriad other variables which cannot be subjected to regimentation. Do these apparently minor differences affect the results? Do different examiners secure different results with the same test? One can do no more than raise these questions at the present time. However, Mr. John F. Murphy, who assisted in the supervision of the Adjustment Service testing work, is in the process of studying a large sampling of the test results obtained by eight different examiners on six or eight different tests. If differences are found, Mr. Murphy hopes to ascertain which tests are most sensitive to differences among examiners.

Still on the subject of test administration, the Adjustment Service experience emphasized the already-recognized need for developing the subjective observation of a client's behavior during the tests to the point where it contributes a significant supplement to the test score.

No test is so accurate that the method in which the client reacts to it can be ignored. Despite the mass-production nature of much of the testing at the Adjustment Service, each examinee was under constant, unobtrusive observation.

Data on observed test behavior were useful to the counselor, particularly in spotlighting those cases in which the test results were likely to be unreliable. In many cases examiners called the attention of the counselor to the desirability of a psychiatric interview, the need for which had been unnoticed by the counselor during his first short interview. Occasionally the psychiatrists encountered cases in which behavior in the testing room furnished the most significant leads for their interviews.

Instructing the examiners in this clinical approach to testing proved to be the most difficult feature of their training. We are convinced that we should devote more attention to the *way* in which a subject performs a test. Should there not be included in the manual for administration of every test a section on significant behavior which should be looked for by the examiner? Perhaps the final step in the training of an examiner should include instruction in this subject by a clinical psychologist or psychiatrist.

There are undoubtedly other questions which might be raised, but enough for the subject of test administration. Let us send the client away while we score his tests. It is, of course, a routine clerical process to arrive at the raw score on a test. The next step is to compare this raw score with norms for people in general to establish its percentile rank with respect to the population at large. The Adjustment Service used norms for each test which were established by correcting statistically a selected sampling of adult white

population. Since the Service used for the most part tests which had been studied at the University of Minnesota Employment Stabilization Research Institute the norms developed by that Institute were also used. These norms have as their base a normal occupational and age selection for Minneapolis, St. Paul, and Duluth, and for this reason may not be entirely adequate for New York City. However, they constitute norms as nearly representative of the adult population as a whole as exist at the present time. However, for more accurate interpretation of test scores, New York City and other communities should develop "local" adult norms, using a "standard sample" of the population corrected for age and occupational composition to conform with the census distribution. For comparative purposes, the techniques used in developing these norms should probably be identical with those described by the Employment Stabilization Research Institute in "A Manual of Selected Occupational Tests."[3] The sponsorship of such research would be a worth while outlet for foundation funds.

Having scored and percentiled the tests, we must interpret the significance of the results as they bear on the program we shall plan with the client. The need for more and better "Occupational Ability Patterns,"[4] is patent. The questionable validity and prognostic worth of most devices need little emphasis. The lack of precision of tests and the caution and artistry needed in interpreting their results and integrating them with other information about the individual are recognized by all.

However, one specific point merits mention. We have come to lean heavily on inventory tests such as the Strong Interest Blank, the Hall Attitude Inventory and what Donald Pater-

[3] Green, Helen; Berman, Isabel; Paterson, D. G.; and Trabue, M.R. "A Manual of Selected Occupational Tests." Employment Stabilization Research Institute, University of Minnesota.

[4] "Occupational Ability Patterns," by M. R. Trabue, *The Personnel Journal*. February, 1933.

son has called the "seductive Bernreuter." We have found that there is as much and more to be garnered from critical study of the ways in which the clients respond to specific statements or questions on these inventories, as from their formal scores. Here is a rich field requiring exploration. A competent counselor, drawing upon his ingenuity—and common sense—finds that informal, item-study of a blank suggests "spring-boards" to additional investigation during the interview. However, he does this cautiously, on an informal, trial and error basis. Should we not investigate which items are most pertinent with respect to specific age groups, clients with specific types of problems, etc., and develop an organized, though not necessarily rigid, approach to using these blanks as interview aids?

Then, entirely apart from tests, have we explored the possible contributions to individual diagnosis of personal, occupational, educational and avocational background blanks? All of us in this field have stressed the usefulness of these data, but we have not probed successfully the techniques for obtaining, and the clues to be derived from, such items as reasons for leaving past jobs, a client's own statement of ambitions, records of studies he has pursued since leaving school, and the pattern of avocational pursuits he engaged in prior to counseling.

These questions are not presented as original contributions to psychometric thought. Most of them have been raised in the past by various workers in the field. My interest is one of emphasis. When we withdraw our tools from the psychological laboratory and press them into emergency service the need for more knowledge becomes a crying need—crying through loudspeakers.

The main thought which I should like to underscore is that the establishment of a counseling service equipped with testing and other diagnostic facilities must be equipped with a research division. Economic as well as scientific waste results from the use of technical devices unaccompanied by technical

investigations into their reliability and actual usefulness. Since we need not, we should not accept these devices on faith alone.

The Adjustment Service of New York was a "service" project designed to demonstrate the usefulness of the products of research in serving large numbers of people. In order to fulfill this objective, every dollar was directed to "service." Unfortunately, no research in the customary sense of the word could be introduced. Although the data gathered, now in the custody of the National Occupational Conference, constitute an unusually rich body of research material, we are inclined to doubt that it will be tapped extensively. Research workers, although reputedly cold-blooded, prefer to work with "hot" material. Research into the use of diagnostic tools in adult counseling must be concurrent with the operation of such a service. Whatever reservations we may have about other conclusions we have drawn from this experiment, of this one thing we are certain.

A NOTE ON THE STANFORD-BINET VOCABULARY TEST

HARRY C. MAHAN AND LOUISE WITMER
Warren State Hospital

IN all so-called verbal tests of intelligence, such as the Stanford-Binet, the knowledge of word meanings plays a very important part. This was pointed out some time ago by Terman[1] and is of particular interest at the present time because of the use of the vocabulary in determining the original intelligence of deteriorated patients.[2] Circumstances sometimes render the administration of the entire Binet impractical, and in testing adults the vocabulary can often be used alone to rule out a diagnosis of mental deficiency. In doing this it is desirable to know the most probable mental age for any given score on the vocabulary. Although Terman's[3] data enables us to do this with a random sampling of school children it was thought advisable to work out the relationship with actual clinical cases.

Our subjects were 269 cases brought to the Warren State Hospital Mental Health Clinics. The group consisted almost entirely of children, none of whom were thought to be psychotic. The mean chronological age was 12.7 years and the standard deviation 3.29; the mean mental age was 9.7 years and the standard deviation 2.35. The subjects were given both of Terman's fifty word lists and the mean score was 27 words with a standard deviation of 13. The degree of correlation between mental age and vocabulary score, as estimated by the Pearson *r*, was .87. In order to estimate mental age from vocabulary score we found the regression of the former

[1] Terman, Lewis M., *The Measurement of Intelligence.* Boston, Houghton Mifflin Co., 1916, p. 230.

[2] Babcock, Harriet, *An Experiment in the Measurement of Mental Deterioration. Archives of Psychology,* No. 117, Aug. 1930, p. 6.

[3] Terman, Lewis M., *The Intelligence of School Children.* Boston, Houghton Mifflin Co., 1919, p. 308–312.

on the latter and worked out the regression equation. The mental age equivalent for each test score, as given by this equation, is presented in Table I. The mental age equivalents are given in terms of years and months although in the calculations the years were divided into decimals to facilitate the mathematical treatment.

TABLE I

Mental Age Equivalents for Scores on the Vocabulary Test

VOC. SCORE	M.A.	VOC. SCORE	M.A.
9	6–11	35	11–00
10	7–00	36	11–1
11	7–2	37	11–3
12	7–4	38	11–5
13	7–6	39	11–7
14	7–7	40	11–9
15	7–10	41	11–11
16	8–00	42	12–1
17	8–2	43	12–3
18	8–3	44	12–5
19	8–5	45	12–6
20	8–7	46	12–8
21	8–9	47	12–10
22	8–11	48	13–00
23	9–1	49	13–2
24	9–3	50	13–4
25	9–5	51	13–6
26	9–6	52	13–8
27	9–8	53	13–9
28	9–10	54	13–11
29	10–00	55	14–1
30	10–2	56	14–3
31	10–4	57	14–5
32	10–6	58	14–7
33	10–8	59	14–9
34	10–10	60	14–11

The probable error of estimate for our equation is 9.4 months, which means that the vocabulary will give us the mental age within 9.4 months 50 per cent of the time. This is essentially

the same probable error found by Terman with his group of school children. Although on the surface it may seem improbable, it is entirely possible that a vocabulary test alone can predict certain kinds of behavior with greater accuracy than a vocabulary test plus other types of material.

A question which clinicians often ask in regard to the administration of the Stanford-Binet vocabulary test is this: Do I need to give both of the fifty word lists? If not, which is the better one to give? It has often been noticed that the first list is easier than the second and Terman admits that the words are not arranged in their exact order of difficulty. To estimate the value of each word, and to determine the best fifty words to use, the frequency of success on each of the hundred words was tabulated. Our group for this study consisted of 350 individuals, the scores of hospital patients being used in addition to those of clinic cases. Both fifty word lists, with the number of successes on each word, are given in Table II. The total number of successes on the first list was 5,591, and on the second list 4,648. This indicates that the second list is considerably more difficult than the first and their use as alternates is unjustified. The table also indicates that many words are misplaced as to difficulty.

TABLE II
Frequency of Success on Each Word

WORD	SUCCESSES	WORD	SUCCESSES
1. gown	332	1. orange	341
2. tap	332	2. bonfire	331
3. scorch	315	3. straw	339
4. puddle	340	4. roar	309
5. envelope	343	5. haste	250
6. rule	325	6. afloat	303
7. health	308	7. guitar	299
8. eye-lash	288	8. mellow	180
9. copper	248	9. impolite	247
10. curse	256	10. plumbing	222
11. pork	285	11. noticeable	202
12. outward	222	12. muzzle	188

TABLE II—*Continued*

WORD	SUCCESSES	WORD	SUCCESSES
13. southern	212	13. quake	127
14. lecture	141	14. reception	113
15. dungeon	211	15. majesty	104
16. skill	138	16. treasury	153
17. ramble	130	17. misuse	170
18. civil	85	18. crunch	82
19. insure	138	19. forfeit	67
20. nerve	167	20. sportive	84
21. juggler	78	21. apish	49
22. regard	75	22. snip	75
23. stave	73	23. shrewd	39
24. brunette	92	24. repose	31
25. hysterics	92	25. peculiarity	79
26. Mars	94	26. conscientious	44
27. mosaic	24	27. charter	43
28. bewail	38	28. coinage	35
29. priceless	51	29. dilapidated	40
30. disproportionate	33	30. promontory	6
31. tolerate	38	31. avarice	8
32. artless	22	32. gelatinous	8
33. depredation	7	33. drabble	5
34. lotus	17	34. philanthropy	7
35. frustrate	10	35. irony	7
36. harpy	3	36. embody	6
37. flaunt	10	37. swaddle	6
38. ochre	6	38. exaltation	11
39. milksop	2	39. infuse	7
40. incrustation	3	40. selectman	7
41. retroactive	3	41. declivity	3
42. ambergris	1	42. laity	2
43. achromatic	2	43. fen	1
44. perfunctory	0	44. sapient	0
45. casuistry	0	45. cameo	10
46. piscatorial	0	46. theosophy	4
47. sudorific	0	47. precipitancy	2
48. parterre	0	48. paleology	1
49. shagreen	0	49. homunculus	0
50. complot	1	50. limpet	1

As a result of these findings an attempt was made to select fifty words which could be used in place of the entire hundred. Although we do not know the optimal length of a word list of this kind it is safe to say that fifty is about the minimum, and when these are given in their exact order of difficulty only a small percentage of the fifty is actually presented. Several leading clinics never use but one of the two fifty word lists given by Terman.

In the selection of our fifty optimal words, which are presented in Table III, several criteria were set up. First, the

TABLE III

Revised List of Fifty Words

WORD	SUCCESSES	WORD	SUCCESSES
1. envelope	343	26. conscientious	44
2. puddle	340	27. dilapidated	40
3. gown	332	28. tolerate	38
4. rule	325	29. disproportionate	33
5. scorch	315	30. mosaic	24
6. roar	309	31. lotus	17
7. eyelash	288	32. exaltation	11
8. curse	256	33. flaunt	10
9. copper	248	34. avarice	8
10. impolite	247	35. philanthropy	7
11. plumbing	222	36. depredation	7
12. dungeon	211	37. selectman	7
13. muzzle	188	38. embody	6
14. misuse	170	39. ochre	6
15. lecture	141	40. theosophy	4
16. ramble	130	41. incrustation	3
17. reception	113	42. declivity	3
18. majesty	104	43. achromatic	2
19. Mars	94	44. precipitancy	2
20. hysterics	92	45. fen	1
21. crunch	82	46. complot	1
22. peculiarity	79	47. perfunctory	0
23. regard	75	48. casuistry	0
24. stave	73	49. sudorific	0
25. priceless	51	50. shagreen	0

total number of successes must be approximately equal to half of the successes on the entire hundred; second, the words must be neither ambiguous nor emotionally toned; third, their increasing order of difficulty must be fairly constant. These criteria should help us make our vocabulary test more efficient both in time and accuracy.

SUMMARY

A table to facilitate the estimation of Stanford-Binet Mental Age from score on the vocabulary test has been worked out by means of the regression equation. An attempt has been made to select the best fifty out of the hundred words given by Terman, with the hope of cutting down the time necessary to administer the test.

A NEW SCORING APPARATUS FOR THE BERN-REUTER PERSONALITY INVENTORY

CLIFFORD B. CONWAY
University of Toronto

THE scoring of a large number of Bernreuter personality inventories is an arduous task which usually results in errors in as many as 60 per cent of the papers if the additions are done mentally. To obtain speed and accuracy and to eliminate checking, a new key has been devised which allows simultaneous scoring of all six traits, a method which might be adapted to similar multiple-scale tests.

The scoring key consists of two sheets of cardboard stapled together to act as a holder for strips on which are typewritten the weighted values for the responses to each question. These strips slide back and forth through loose staples which act as guides, bringing the values to be added into six vertical columns. The strips appear as follows when completed:

110	Yes	No	↑	-1	4	1	1	0	3	1	-5	-1	-1	3	-4	-1	1	0	-1	-1	-2
111	Yes	No	↑	-2	0	-1	2	-2	-1	2	-1	1	-2	2	0	-2	2	0	2	0	5
112	Yes	No	↑	-1	6	1	2	-3	7	1	-6	-1	-1	3	-4	-2	-1	0	-2	-1	-1
113	Yes	No	↑	2	-1	2	-2	3	2	-1	1	-1	2	-2	-1	-3	1	-2	0	3	-2

Before typing the strips, three holders should be constructed with two openings in each top sheet of cardboard so that when the response is visible through the left opening, the set of six values will be seen through the right. Sample paper strips may be typed to adjust the spacing of the responses so that setting these responses at the left will bring the correct set of six figures into line in the right opening. The whole may then be typed on long sheets of cardboard or opaque white celluloid and proofread before being cut into horizontal strips. The celluloid is recommended as being stiffer and more durable.

In constructing the holder, after the two long vertical openings are cut in the cover, the two sheets are firmly stapled together at the top and bottom. Then two or three vertical lines are drawn and marked off at half-inch intervals to locate the staples which are to act as guides for the sliding strips. A narrow strip of cardboard doubled over and held between the points of the staple during the act of stapling, and later withdrawn, will keep the staple loose enough to allow the strip to slide freely. If the cover is made narrower than the lower sheet of cardboard and inverted thumb tacks pierce the ends of each strip, these will serve as convenient handles as well as stops which bring the figures into line when the strip is pulled all the way in either direction.

In operation, considerable time is required to set the strips so that the responses in the left opening correspond with the responses on the test paper. An average of less than half of the strips must be reset, however, in changing from paper to paper, depending, of course, on the homogeneity of the group tested.

In scoring 600 tests, the author has found the time saved was approximately 12 minutes per paper, a net saving of many days. Of greater importance than the saving of time is the increase in accuracy. Using the usual scoring keys an average of 3.8 errors per test paper occurred. This was reduced to .8 of an error per paper using the new key.

SENESCENT EFFICIENCY AND EMPLOYABILITY

JEANNE G. GILBERT

St. Charles Mental Hygiene Clinic, Brooklyn, N. Y.

CONSIDERING the urgency of unemployment insurance and old age pensions, it might be well to pause and consider scientifically those for whom these measures are advocated, particularly those who will be eligible for old age pensions.

Because of the difficulty of securing and maintaining employment, many elderly persons will apply for pensions as a last resort. How many of these could profitably be absorbed into industry is a question which merits grave consideration. As medical science advances and enables an increasing number of individuals to reach the sixties and beyond and as industry becomes more prone to purge its ranks of older workers, the burden of expense entailed therefrom may well become intolerable. It is recognized that some individuals do keep active and efficient until an advanced age, but the relationship between activity and efficiency has never been determined. Agreed that the exercise of a function tends to maintain efficiency of that function and that the older worker learns more slowly than does the younger worker, it remains to be determined how much efficiency will be lost by continued unemployment.

This study makes an investigation of the intellectual qualifications and the mental efficiency of unemployed persons in the sixties and compares them with a group of regularly employed individuals of comparable age.

The regularly employed group consists of 41 individuals between the ages of 60 and 69 years inclusive with an average age of 63.31 years. The unemployed individuals number 105, this number being divided into two groups: one consisting of persons without regular gainful employment from one to two years inclusive, and the other group consisting of persons unemployed

for a period of three to ten years inclusive. The former group includes 55 individuals between the ages of 60 and 69 inclusive, average age 64.63; the latter includes 50 individuals between the ages of 60 and 69 years inclusive, average age 63.86 years. No housewives, voluntarily retired or pensioned individuals or persons known to be or claiming to be in too poor health to work are included in the unemployed groups; likewise, no one is included who had been unemployed for less than one year at the time of taking the test.

Each individual was given the Babcock Test of Mental Efficiency. This test employs Terman's vocabulary as the measure of original intellectual level and a series of other tests involving timed recall of old learning, motor ability, new learning, various types of memory, retention, etc., for the efficiency phase of intelligence and then takes the discrepancy between the scores on these two types of tests as the measure of efficiency or the efficiency index (E.I.).

2. RESULTS

The average efficiency index* of 0.0 obtained by 20-year olds is used as the standard for computing the efficiency indices of all groups.[1]

Table 1 shows the large and reliable differences found between the regularly employed group and those unemployed from one to two years inclusive.

From these figures it can readily be seen that individuals in the sixties who have been unemployed for a relatively short

* For an individual to obtain an efficiency index of 0.0 is to be functioning with exactly average efficiency. To do this his combined scores on the group of efficiency tests must coincide with the average of those obtained by others of his intellectual level, as measured by Terman's vocabulary. For example, the average efficiency score of those with a 15 year vocabulary level is 15.1; therefore, an individual with a 15 year intellectual level who scored 15.1 would have an E.I. of 0.0; if he scored 16.1 his E.I. would be +1.0 and he would functioning with good efficiency; if on the other hand, he obtained a score of 14.1 his E.I. would be −1.0 and he would tend to be inefficient.

[1] Gilbert, J. G., Mental Efficiency in Senescence, Arch. Ps. No. 188, 1935.

TABLE 1

	VOC. LEVEL	AV. E.I.	S.D	$P.E._{av.}$	DIFF.	$P.E._{diff.}$	$D/P.E._{diff.}$
Employed group	18.31	–3.46	1.66	.1437			
Gr. unemployed 1–2 years	15.76	–5.19	1.34	.1218	1.73	.1883	9.20

but consistent period are, on the average, intellectually inferior to those regularly employed and, in addition, function with relatively less efficiency.

Table 2 shows still greater differences between the regularly employed group and the group unemployed for three to ten years inclusive.

TABLE 2

	VOC. LEVEL	AV. E.I.	S.D	$P.E._{av.}$	DIFF.	$P.E._{diff.}$	$D/P.E._{diff.}$
Employed group	18.31	–3.46	1.66	.1437			
Gr. unemployed 3–10 years	15.24	–5.62	1.17	.1114	2.16	.1818	11.88

A point to be noted in these tables is that the vocabulary levels of both unemployed groups fall near the average of the population as a whole, whereas that of the employed group is superior to that of the population as a whole. But in all comparisons it is the differences in general mental efficiency, *i.e.*, in the efficiency indices, which are the prime concern; for to know the efficiency with which one functions is to understand his capabilities in practical situations.

Table 3 shows the results obtained when the two unemployed groups are combined and compared with the employed group.

These differences in efficiency indices between the employed and the unemployed groups are large enough to be significant, particularly when we note that two-thirds of the employed group score between –1.8 and –5.12, while two-thirds of the total unemployed group score between –4.15 and –6.17. Several

TABLE 3

	VOC. LEVEL	AV. E.I.	S.D	$P.E._{av.}$	DIFF.	$P.E._{diff.}$	$D/P.E._{diff.}$
Employed group	18.31	–3.46	1.66	.1437			
Total unemployed gr.	15.51	–5.43	1.28	.0840	1.97	.1664	11.86

things, however, must be taken into consideration as having a bearing on these differences. To begin with, from the vocabulary levels, we see that the employed group is, on the average, intellectually superior to the unemployed groups, whether the latter be considered as a whole or separated into groups of greater or lesser periods of unemployment. This, of course, is to be expected as the professional classes produce a greater number of intellectual superiors, and it is this class which tends to retain its employees to a more advanced age than do the industrial classes.[2] Also, those of the very highest intellectual levels show some tendency to maintain a higher level of efficiency in advancing years than do those of lesser intellect.[1]

These factors, however, cannot account solely for the differences in efficiency. Neither can age differences, for although a reliable decrease in efficiency has been found from the early to the late sixties[3] the ages of these groups correspond too closely to make this a factor of prime importance. Undoubtedly, general mental attitude and lack of practice contribute much to the deterioration. Many of those in institutions for the aged seem to have given up the struggle to maintain efficiency and apparently consider themselves too old to make the effort; the majority of those on the outside seem discouraged and embittered by their experiences of being discarded from jobs in favor of younger men, and after a period of continued unemployment lose interest not only in securing regular employment but, to a large extent, in their general environment as well. Lack of interest in learning, apathy toward environment and

[2] Miles, W. R., Age and Human Society, Handbook Soc. Ps., 1935, p. 596f.

[3] Gilbert, J. G., Mental Efficiency in Senescence, Arch. Ps. No. 188.

lack of normal opportunity to exercise efficiency can operate to bring about a rapid deterioration. Whether or not this deterioration is progressive beyond a certain point remains to be seen.

Table 4 shows the comparative scores of the group unemployed one to two years and the group unemployed three to ten years.

TABLE 4

	VOC. LEVEL	AV. E.I.	S.D	$P.E._{av.}$	DIFF.	$P.E._{diff.}$	$D/P.E._{diff.}$
Unemployed 1–2 years	15.76	–5.19	1.34	.1218			
Unemployed 3–10 years	15.24	–5.62	1.17	.1114	.43	.1651	2.61

It will be noted that the intellectual levels of these two groups are practically the same and that, although there is a slight tendency for those longer unemployed to be less efficient, the difference between the indices is not reliable. Considering the marked difference in efficiency scores between those employed and those unemployed for even as short a period as one to two years, this gives some indication that unemployment may bring about a sudden and rapid deterioration to a certain point but that beyond this point deterioration proceeds at a more gradual rate. There is, of course, the added factor that the less efficient individuals have more chance of being dropped first from employment and that the better the efficiency the better the chance of remaining employed. There can be no doubt, however, that this plays a more important part in normal times than in these days of economic stress and agitation for replacement of the older with a younger, more vigorous man.

3. SUMMARY

1. This has been an investigation of the intellectual qualifications and the mental efficiency of employed and unemployed persons in the sixties, the Babcock Test of Mental Efficiency being used for the comparisons.

2. It has been found that persons in the sixties who engage in regular gainful employment are, on the average, superior intellectually to those unemployed, whether we consider the unemployed as a single group or separate them into those unemployed one to two years and those unemployed three to ten years. They are also intellectually superior to the average of the population as a whole.

3. There is a large and reliable difference in mental efficiency between the employed group and the separate and combined unemployed groups, this difference being in favor of the employed group. It is felt that lack of practice and unfavorable mental attitudes are important contributing factors to this deterioration.

4. There is a difference in efficiency indices between those unemployed for one to two years and those unemployed three to ten years, the difference being in favor of those unemployed for the shorter time, but the difference is not reliable.

5. It is probable that the less efficient individuals are dropped first from employment because of their inefficiency, but the results obtained here indicate also the possibility that unemployment of older persons may bring about a sudden and rapid deterioration of mental efficiency, this deterioration progressing rapidly only to a certain point and then proceeding more slowly.

In conclusion, the author would like to offer the suggestion that industry might profitably make use of the older worker instead of discarding him in favor of the younger man, provided the selection of the worker be made on a scientific basis and his degree of mental efficiency or mental impairment taken into consideration in determining his work. Given the advantages of the older worker who because of long experience and familiarity has fewer industrial accidents and spoils less material besides causing less turnover,[4] the disadvantages of less speed and decreased adaptability might be lessened by fitting the

[4] Miles, W. R., Age and Human Society, Handbook Soc. Ps. 1935, p. 596f.

speed and type of work to the decreased general efficiency of the worker and making remuneration commensurate with his production.

The time is ripe for the scientific determination of an individual's ability to do efficient work in his own field, and of his ability to take up work in a new field. A way is open in the new measures of mental efficiency, and it is the progressive industrialist who will be far-sighted enough to include in his economy program a well-devised plan for the utilization of the too often wasted efficiency of those of advancing years. Philanthropy should be most appealing indeed when it can prove economically advantageous to benefactor as well as beneficiary.

NEWS AND NOTES

The First International Congress of Sanatoria and Private Nursing Homes will be held in Budapest at the end of September, 1936. Those who wish to submit contributions to the program should communicate as soon as possible with the Committee of the First International Congress of Sanatoria and Private Nursing Homes, Budapest, Margitsziget, Sanatorium.

Dr. Walter J. Greenleaf, Office of Education Specialist in Higher Education, has recently prepared a report of a study of salaries paid to presidents, deans, professors, associate professors, assistant professors, and instructors in fifty-one Land-Grant Colleges located in every state, Alaska, Hawaii, and Puerto Rico. It was found that deans employed on a nine-month basis saw their median salaries decreased from $5,193 in 1928–29, to $4,187 in 1934–35. The survey also revealed similar depression-period slashes in salaries paid to all professors of varying ranks. Full-time professors on a nine-month basis received an average salary of $4,278 in 1928–29; in 1934–35 it had decreased to $3,775. Those on an eleven-twelve month basis had their salaries cut from $4,161 to $3,682 over the same period of time. Associate professors dropped from $3,352 to $2,903; assistant professors from $2,738 to $2,449; instructors from $2,005 to $1,769 over the four-year period. Salaries for the present year, however, are higher than last year.

The study also revealed a total of 11,416 full-time staff members instructing 179,973 resident and 77,710 extension and correspondence land-grant college students. Of these 11,416 staff members, one-third were deans or full professors, while two-thirds or nearly 7,500 held ranks below that of professor.

An organization to be known as the *Committee for the Study of Suicide, Inc.*, was incorporated last December under the laws of the State of New York and began its activities early in January. The Board of Directors and officers include Dr. Gerald R. Jameison, President; Mr. Marshall Field, Vice-President; Dr. Henry Alsop Riley, Treasurer; Dr. Gregory Zilboorg, Secretary and Director of Research; Miss Elizabeth G. Brockett, Dr. Franklin G. Ebaugh, Dr. Herman Nunberg, Dr. Dudley D. Schoenfeld and Dr. Bettina Warburg.

The Committee plans to undertake a comprehensive study of suicide as a social and psychological phenomenon according to the following general outline:

1. *Intramural studies* of individuals inclined to suicide in selected hospitals for mental diseases. These will embrace constitutional, neurologi-

cal, psychiatric and psychoanalytic investigations of the phenomenon with special reference to therapy and prevention.

2. *Extramural studies* of ambulatory cases afflicted with suicidal trends or with obsessional wishes for their own death. These studies will be primarily therapeutic in nature. The medical and neurological status of all cases will be a prerequisite of each case record.

3. *Social studies* of suicide. Various attempts at suicide will be followed up by experienced psychiatric social workers and the subjects will be urged to submit to psychiatric treatment.

4. *Ethnological studies, i.e.,* comprehensive investigation of suicide among primitive races.

5. *Historical studies* of suicide will be pursued systematically under the auspices of the Committee, so as to make available a scientific history of the phenomenon as a social and medico-psychological problem.

The Executive Offices of the Committee are located at Room 1404, the Medical Arts Center, 57 West 57th Street, New York City.

America's northernmost University at Fairbanks, Alaska, established in 1922 with six students enrolled, now registers 180 students, reports the Office of Education, Department of the Interior. Last year, according to Dr. Charles E. Bunnell, first and only President of the institution, every member of the graduating class helped in putting himself or herself through college, and every member had a position awaiting on receiving a diploma. The University of Alaska is one of the 69 land-grant colleges and universities in the United States and by virtue of this fact receives Federal support for instruction in agriculture and the mechanic arts.

The Psychological Institute of the University of Vienna announces the Fifth Annual Summer School in Psychology for English-speaking students to be held from July 13 to August 8, 1936. The following courses will be offered: Human Personality, Speech and Language, Childhood and Adolescence, Biographical Methods, Experimental Psychology, Viennese Tests for Children, Psychology of Expression. Students registered for these courses may obtain six semester-hours credit, which can be transferred to other institutions under the usual conditions, from the University of Kentucky, which is cooperating in offering this Summer School for the fifth consecutive year. Further information may be obtained either from Dr. Henry Beaumont, University of Kentucky, Lexington, Kentucky, or from Dr. Egon Brunswik, Psychological Institute of the University, Liebiggasse 5, Vienna I, Austria.

A new publication, *Educational Abstracts*, has just made its initial appearance. It is to be published bi-monthly under the editorship of

Norman J. Powell, with Helen M. Born, Samuel Goldberg, Daniel Green, Sylvia D. Powell and H. Robert Weiss as associate editors, and a board of forty-three cooperating editors, a number of whom are representatives of foreign institutions.

The contents of the first issue for January–February consist of short abstracts of studies in about thirty different fields of education. Among other headings are included Administration, Organization and Supervision; Adult Education; Child Development; Commercial and Comparative Education; Educational Psychology, Sociology and Economics; Higher Education; Household Arts; Language Arts; Professional, Religious, Rural and Secondary Education; and Vocational and Industrial Education.

Educational Abstracts, patterned after that of *Psychological Abstracts*, "seeks to provide a comprehensive series of abstracts of both the American and foreign literature. To fulfill this purpose, an international abstracting system is in the process of formation. Specialists in the several educational areas will abstract material in the field of their major interest."

The subscription rate is $4.00 per year; single copies, $1.00. The Editorial and Business Office is located at 230 Fifth Avenue, New York City.

Preliminary announcements have been received of the XI Congres International de Psychologie, to be held in Madrid, September 6–12, 1936. Many interesting features are being arranged for this Congress about which a more complete announcement will be made in a later issue of this *Journal*. All correspondence concerning the Congress should be addressed to the President, E. Mira, of the Secretary general, J. Germain, Instituto Nacional de Psicotecnia, Alberto 25, Madrid, Spain.

BOOK REVIEWS

FITZ-SIMMONS, MARIAN J. *Some parent-child relationships as shown in clinical case studies.* New York, Bureau of Publications, Teachers College, Columbia University. 1935. xi + 162 p. (Teach. Coll. Contrib. No. 643).

In many child guidance or psychological clinics throughout the country case records on all sorts of children's problems have been accumulating during the past twenty or thirty years. During this time, the very familiar question has been asked, "What use can be made of their records? Surely this mass of material should be used for research. But how?" Sporadically this author or that dug out information on some point, usually one that was quantified, and made a contribution. But no one offered a method of analyzing the whole case record for the all-important question of family attitudes.

Dr. Fitz-Simmons has devised a Guide which enables the research worker to secure an analytic picture of the maternal and paternal attitudes toward the child. She has taken a large step toward the final solution of the problem earlier referred to. This is pioneer work and can hardly be expected to be perfect. The value of the Guide depends upon the care with which the histories are taken, and the care and judgment used in analyzing them. Inadequacies of the method cannot be ascribed to the first of these—rather it may lead to better histories, suggestions for which the author makes. Perhaps the dependence upon the person analyzing the case may seriously affect the Guide's value. The author points out that training and personal theoretical bias may affect the allotment of a particular item of behavior.

As a test of the Guide's usefulness the author analyzed a group of about 100 case records. From this analysis is shown relationships between mothers' and fathers' attitudes and certain behavior and personality problems. For example, the greatest number of withdrawing problems per child were found when the mother's attitude was positive and the father's negative, while the smallest number of withdrawing problems occurred with positive father's attitude and negative mother's. Again it is shown that the effect of material rejection depends on the father's attitude toward the child. As a method for the study of questions involving parental attitudes this Guide offers great possibilities.

C. M. LOUTTIT,
Indiana University.

J. G. BEBE-CENTER. *The Psychology of Pleasantness and Unpleasantness.* D. Van Nostrand Company. Pp. v + 427.

"The purpose of the present volume is to remedy the ghost-like state of the psychology of pleasantness and unpleasantness by bringing its facts to-

gether into a single orderly structure. . . . The effort throughout has been to state the facts with a minimum of interpretation . . . whatever value the work may have should thus prove relatively independent of personal systematic bias.'' Thus writes the author in his introduction.

After analyzing the concepts of pleasantness and unpleasantness in Chapter I, the author adopts the term *hedonic tone* to characterize these concepts. He makes it clear that it is these concepts of pleasantness and unpleasantness (not the experiences underlying the concepts), which he assumes to be two quantitative variables whose relationship can be expressed as positive and negative phases of a single more general algebraic variable that he is interested in reporting. The subject matter of his book then is to be conceptional data. It will at once be seen that the author sets a methodological limit to the kind of data to be reported. In Chapter II is found an excellent review of the methods of Fechner—*methods of impression*. Besides reporting these psycho-physical methods an evaluation of them from Fechner to Thorndike and Thurstone is also given. The last half of this chapter is devoted to the *methods of expression* from Mosso's work to the present.

Chapter III deals mainly with theoretical considerations and experimental findings centered about the problem of the relation of hedonic tone to mental elements. Works from the two main schools are reviewed. One school, it will be recalled, conceived hedonic tone to be an attribute of sensations; while the other school contended hedonic tone to be an attribute of special affective elements. The author's analysis of experiments from these two points of view lead him to conclude that the problem of the relation of hedonic tone to mental elements does not at present exist. He hastens, however, to salvage from these experimental data some incidental observations from Nafe and Young on the relationship of hedonic tone to brightness-dullness, to localization, etc. The next topic considered is hedonic tone in its relation to primary external stimuli. Influenced somewhat by the Gestalt school, data here reported deal ''very largely with stimuli defined only in terms of corresponding phenomena. . . .'' However, characteristics of stimuli which correlate with phenomena come in for analysis as well. Experiments bearing on summation, modality differences, duration, and adaptation are reported. Much theoretical and speculative material on temporal and spatial completeness as characteristics of the phenomena in addition to the facts are considered. The author ends this chapter by applying Spearman's *tetrad equation* to some data on hedonic tone. The results indicate that certain primary external stimuli may have a *general hedonic value*. Next experiments are summarized under the classification of hedonic tone in relation to secondary external stimuli. Again, the neo-Titchenerian viewpoint joins hands somewhat with the Gestalt viewpoint. Pointed comments are made by the author while

analyzing the experiments on "secondary stimuli known to affect the sensory characteristics of a phenomenon (*e.g.*, stimuli inducing contrast), and secondary stimuli not known to have such an effect on a phenomenon." In this chapter one finds experiments reported and conclusions drawn on the relation of pleasantness and unpleasantness to attention, to successive contrast, to successive assimilation, to adaptation, and to habituation. On the concluding pages of Chapter V the author relates pseudo-habituative shifts in hedonic tone to other psychological and physiological laws. In fact, immediately the way is paved for a shift in methodological approach from that of verbal reports resulting in conceptual data to that of choice behavior and to phenomena revealed instrumentally which are supposedly accompanied by hedonic tone. The author does not surrender his original approach; he merely becomes more eclectic and includes the more dynamic approaches in which the affective processes are concerned as part of the biological phenomenon in the organism's adjustment. The reviewer agrees with the author that pleasurable and unpleasurable experiences no doubt play an important role in all experiential life but to include results obtained through means other than that which he has limited to verbal report is committing a serious methodological error.

The five chapters following deal with experimental results obtained not only as conceptual data, but also as choice responses and as physiological changes revealed through instrumentation. The author is sophisticated. He is aware of his shift. He is also aware of the fact that psychological results are in part at least a function of methods used in obtaining these results. The author set out to report quantitative variables obtainable only by the method of impression, yet from now on results are considered from several methods—particularly the methods of expression along with the methods of impression.

Hedonic tone is related to such motivating factors as cognitive dispositions, evaluative dispositions, needs (physiological), wishes (including some pathological). Relationships are deduced from data reported to the effect that hedonic tone is influenced by physiological needs but that this relationship is not a direct one. Physiological needs like environmental changes act through sensory stimulation in the determination of hedonic tone. In the treatment of maturation and learning the author infers that hedonic tone accompanies emotional behavior. Some pertinent experiments bearing on food choices and on color preferences in children are reported here. Next come experiments bearing on the relation of hedonic tone to muscular and glandular responses.

Representative experiments on respiratory and circulatory changes, galvanic reflexes, extension, flexion, and other bodily changes are related to hedonic tone. Pleasantness and unpleasantness during the learning process, after the learning process, come in for review. Chapter X is short.

It deals with hedonic tone and nervous processes. The few results indicate that "hedonic tone depends directly upon neural processes in the thalamus."

The book ends with Chapter XI reviewing the literature on the theories of hedonic tone—theories dealing with two problems: "That of the nature of the *conscious carrier* of hedonic tone, and that of the *immediate conditions* or causes of hedonic tone." Theories of Ziehen, Stumpf, Titchener, Warren, and Kreuger on the first problem are reviewed; theories of Herbart, McDougall, Thorndike, Troland, Allport, and Marston on the second problem are reviewed.

The author ends his book with his own *heuristic hypothesis* based on the concept that "there is a relation between hedonic tone and certain specific processes in the sense-organs. . . ." Nafe's work on hedonic tone and brightness-dullness; Koehler's work on time-error in judgments; the author's own work and others lend some little experimental support to his hypothesis.

The intensive and extensive review of the literature on this subject; the keen analysis of data and the originality of the author's thinking mark him as scholarly and industrious. The reviewer is in sympathy with the belief of the author that pleasantness and unpleasantness play a dynamic role in the adjustment of living organisms and as such are important problems for study.

It is no fault of the author's that many of the experiments reported can be dignified by the name *experiment* only by a wide stretch of imagination; it is unfortunate that the author limits himself at the outset with methodological conventions and statements about the interpretations when he is motivated to reveal all the approaches to and the relationships of, hedonic tone that he can see. With these observations the reviewer closes by saying it is an excellently done work, with a bibliography that is a model.

JAMES R. PATRICK,
Ohio University.

HARRIET R. MOWRER. *Personality Adjustment and Domestic Discord.* New York: American Book Company. 1935. Pp. xxvi + 290.

This book is fascinating from so many different points of view that the reviewer is at a loss to know which to emphasize. As a plainly written, realistic treatment of problems in which almost all of us have shared to some extent, it makes a personal appeal. As a contribution to methodology it deserves serious consideration. But most of all I value it as a highly efficient job of interpreting personality in terms of the cultural approach.

The dyed-in-the-wool psychoanalyst or behaviorist (if such animals exist outside our stereotypes) would find this book written in an alien vocabu-

lary. The word conditioning is conspicuous by its absence, likewise libido, cathexis and Oedipus. And yet there is nothing in the theoretical structure of the work to which either the analyst or the behaviorist should take exception.

It seems to me that this book ends a period in the history of the psychology of personality. At last we have reached the stage in our understanding of the workings of that strange phenomenon, the human personality, at which we can see that so-called differences between schools of thought have largely been differences in the purely verbal formulation and conception of problems. From the period during which the object of investigation was "all things to all people" we have advanced to a realization that the data of human behavior lead inevitably to certain conclusions, irrespective of the technical terms used to clothe these conclusions.

One of the important distinctions in the book is that which is made between the verbal and overt behavior of the individual, which we may for convenience call personality structure, and the driving forces underlying these manifestations, which we may call personality dynamics. The behaviorists have almost uniformly been guilty of neglecting the problem of dynamics, even when paying lip service to drives, tissue needs and motives. The psychoanalysts, on the other hand, have been so absorbed in their quest for the dynamic factor that they have glossed over the desirability of a careful study of symptoms. In Dr. Mowrer's volume we find an understanding treatment of the inter-relationship of structure and dynamics.

The volume is regrettably short on theoretical material, undoubtedly because it is so liberally annotated with verbatim quotations from interviews with clients. These quotations make the cases alive, and at the same time drive many points home more effectively than could a straightforward statement of the same idea by the author. The cases reported deal with a wide variety of marriage problems, some dependent upon the patterns of personality laid down long before marriage, others growing more directly out of the marriage situation and relations. In all cases emphasis is placed on personalities and not on situations. It is shown, for example, that the "in-law" problem does not depend on having one of the relatives in the household. The removal of such an individual does not alleviate the condition. The basic problem is almost always in the personalities of the two marriage partners.

These cases are further analyzed according to the types of behavior manifested in conflict (structure) and the basic factor which continues even when behavior changes (dynamics). The treatment is weakest in the latter section, partly perhaps because the author was not attempting to work out a coherent theoretical system. For example, Dr. Mowrer is

content with drawing a distinction between the sex drive (in the narrow sense) and response drive (desire for affection, endearments, intimacy and security) without further discussion. The data of psychoanalysis make us question the validity of this as a distinction in dynamics, although it is clearly a distinction in structure. Further, she has given no consideration to conflicts of dominance, although she clearly recognizes in numerous incidents the distinction between dominance and other types of motivation to which she devotes entire chapters. In this connection it is important to note that recent studies of animals (by Murchison, Maslow and others) have demonstrated that sexual behavior is often a manifestation of the dominance drive, rather than the reverse, as orthodox Freudians have interpreted the relationship.

Another aspect of the problem which is amply illustrated but scantily discussed is the process of trial-and-error with substitution of behavior units which is constantly going on in crisis situations such as domestic discord presents. The development of a fixed pattern of adjustment to the problem must be considered as the outcome of a learning process during which equivalent behavior mechanisms are frequently interchanged. The concept of equivalent responses (several responses conditioned to the same stimulating situation, behavioristically speaking) has not been given the recognition it deserves in orthodox psychological circles.

However, I do not want to be interpreted as making these remarks in criticism of Dr. Mowrer's book. Attention is focused primarily on practical problems, and at no place does she claim to present a complete theory of personality. But anyone who decides to construct such a theory must certainly reckon with the data which she has presented.

To psychologists who are not thoroughly acquainted with the cultural approach to personality, this book is heartily recommended as a stimulant to the thought processes. Kimball Young and E. W. Burgess have contributed valuable forewords, which will also prove suggestive. To teachers, the book is recommended as required reading in social psychology, the family, and the psychology of personality.

ROSS STAGNER,
University of Akron.

KINGSBURY, SUSAN M. AND FAIRCHILD, MILDRED. *Factory, Family and Woman in the Soviet Union.* New York: Putnam. 1935. Pp. xxv + 334.

The book is based on rather extensive travels in Russia and on a study of a large amount of documentary material. It is a commendable attempt at a comprehensive evaluation of the status of women in the Soviet Union, lacking the literary flavor of other books on the subject but being more scientific and worthwhile.

The discussion falls into two parts, the first industrial and the second social. The fact that stands out in this first part is that women are playing a larger rôle in industry in recent years, and a proportionately larger rôle in the more skilled occupations. Incentives is one of the major topics discussed. With reference to wages we note that dangerous and heavy jobs have comparatively higher pay than elsewhere and that in the upper ranges there are such additional financial incentives as a car, a secretary or a camp for week-ends. Among craftsmen and experts the quality of the work itself operates as an incentive. The attitude toward the state is apparently an effective motive in some instances, as propaganda assure the worker that he owns the state. Ordinary competition has been replaced considerably by the shock brigades.

Training is done systematically by the Central Labor Institute. The trade unions are strong and plant committees are almost universal. They deal with a wide range of problems ranging from food to education. There is an interesting Institute for Improving Conditions of Labor. It studies such problems as the maximum weight which women may handle on the job without injury.

Turning to the second part of the book we find discussion of the devices for improving the security of women that are featured in many works about modern Russia, such as the Institute for Protection of Motherhood and Childhood, the crêches, the consultation homes for pregnant women, the sanitaria and social insurance. Adult education is apparently coming along and it should be borne in mind that at the outset 70 per cent of them were illiterate. Much of the education centers in the circles or clubs where the largest enrollments are in art, military and physical culture. Then there are the workers schools both vocational and general where the workers may fill in their weak spots. They use laboratory rather than lecture methods now. Housing and general standards of living seem to be improving. The shortened hours compensate somewhat for the fact that women are working outside the home. Cultural opportunities are provided in the ubiquitous movies and in the clubs in connection with the factories. The appendix gives numerous tables of data.

The book does not contain a great deal that will interest the reader specifically as a psychologist. If he is concerned with Russia in general or with women in industry he will find a pretty careful account of some problems. There is a commendable citation of statistics as contrasted with the usual observational account. The sections covering incentives and education contain a little information that would interest the psychologist. However, he would like more detail on how the government manages to create incentive out of attitudes toward the state, how they sell the shock brigade idea, how the training program is organized, details of the "laboratory" method that has supplanted the lecture and what is done

in the way of guidance to supplement the vocational programs. Psychologists naturally would have stressed such questions more than the present authors whose approach is sociological. The reviewer is not disposed to criticize the book from the latter standpoint but it appears at long range to be an unusually good piece of work.

HAROLD E. BURTT,
Ohio State University.

NEW BOOKS AND PAMPHLETS RECEIVED

Books and pamphlets for review should be sent to JAMES P. PORTER, *Editor*, JOURNAL OF APPLIED PSYCHOLOGY, Ohio University, Athens, Ohio.

Adult Education. THEODORE WEISENBURG, ANNE ROE AND KATHARINE E. MCBRIDE. The Commonwealth Fund, New York City, 1936. 155 pp.

Children's Fears. ARTHUR T. JERSILD AND FRANCES B. HOLMES. Bureau of Publications, Teachers College, Columbia University, New York, 1935. 356 pp.

Conflicts between Preschool Children. ARTHUR T. JERSILD AND FRANCES V. MARKEY. Bureau of Publications, Columbia University, New York, 1935. 181 pp.

Crime and Sexual Development. A. N. FOXE. The Monograph Editions, Glen Falls, N. Y., 1936. $2.75. 91 pp.

Development of Rhythm in Young Children. ARTHUR T. JERSILD AND SYLVIA F. BIENSTOCK. Bureau of Publications, Columbia University, New York, 1935. 97 pp.

Elementary School Teacher's Treatment of Classroom Behavior Problems. NELLIE M. CAMPBELL. Bureau of Publications, Teachers College, Columbia University, New York, 1935. $1.50. 71 pp.

General Psychology. Revised Edition. F. C. DOCKERAY. Prentice-Hall, New York, 1935. $3.50. 576 pp.

Instructional Tests in Bookkeeping. FAYETTE H. ELEWELL AND JOHN GUY FOWLKES. World Book Company, Yonkers, N. Y. 92 pp.

Personality. HAROLD V. GASKILL. Prentice-Hall, New York. 1936. 52 pp.

The Physical Disability of Teachers in the White Elementary Schools of Baltimore, Md. ANITA SHEMWELL DOWELL. Johns Hopkins University Studies in Education, No. 24. Johns Hopkins Press, Baltimore, Md., 1936. 98 pp.

Psychology. GLENN D. HIGGINSON. Macmillan Company, New York, 1936. $2.90. 646 pp.

The Relation between Morality and Intellect. CLARA FRANCES CHASSELL. Bureau of Publications, Teachers College, Columbia University, New York, 1936. $4.50. 556 pp.

Directory of American Psychological Periodicals

(*Continued*)

Comparative Psychology Monographs—Baltimore: Johns Hopkins University Press. Subscription $5. 400 pages per volume. Knight Dunlap, Managing Editor. Published without fixed dates, each number a single research. Founded 1922.

Genetic Psychology Monographs—Worcester, Mass.: Clark University Press. Subscription $7.00 per volume. One volume per year. Edited by Carl Murchison. Bi-monthly. Each number one complete research. Child behavior, animal behavior and comparative psychology. Founded 1925.

Psychological Abstracts—Eno Hall, Princeton, N. J. American Psychological Association. Subscription $6.00. 700 pages ann. Edited by W. S. Hunter and R. R. Willoughby. Monthly. Abstracts of psychological literature. Founded 1927.

Pedagogical Seminary and Journal of Genetic Psychology—Worcester, Mass.: Clark University Press. Subscription $14.00 per annum; $7.00 per volume. 1,000 pages annually (2 volumes). Edited by Carl Murchison and an international cooperating board. Quarterly. Child behavior, animal behavior, and comparative psychology. Founded 1891.

Journal of Social Psychology—Worcester, Mass.: Clark University Press. Subscription $7.00. 500-600 pages annually. Edited by John Dewey and Carl Murchison. Quarterly. Political, racial, and differential psychology. Founded 1929.

Personnel Journal—Baltimore: The Williams & Wilkins Co. Subscription $5.00. 500 pages, approximately. Edited by Walter V. Bingham. Bi-Monthly.

Mental Measurement Monographs—Baltimore: The Williams & Wilkins Company. Subscription $5. 400 pages annually. Edited by Knight Dunlap and Buford Johnson. Published without fixed dates, each number a single research. Founded 1925.

Studies in Psychology and Psychiatry—Baltimore: The Williams & Wilkins Company. Subscription $5.00. 400 pages annually. Edited by Edward A. Pace. Published without fixed dates, each number a single research. Founded 1926.

Journal of Educational Psychology—Baltimore, Md.: Warwick & York. Subscription $6.00. Edited by Jack W. Dunlap, Harold E. Jones, and Percival M. Symonds. Published monthly except June to August. Founded 1910.

Child Development—Baltimore, Md.: Williams & Wilkins Company. Subscription $5.00. 400 pages annually. Edited by Buford Johnson. Quarterly. Founded 1930.

Character and Personality—Durham, N. C.: Duke University Press. Subscription $2.00 per annum. Quarterly. Edited by Robert Saudek (London) and Ernest Seeman (Durham, N. C.). Founded 1932.

The Psychological Exchange—11 East 125th Street, New York, N. Y. Subscription $2.00 per annum. Bi-monthly. Edited by James Hargan. Founded 1932.

Directory of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.: Cornell University. Subscription $6.50. 624 pages annually. Edited by K. M. Dallenbach, M. F. Washburn, M. Bentley, E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

Journal of General Psychology—Worcester, Mass.: Clark University Press. Subscription $14.00 per annum; $7.00 per volume. 1,000 pages annually (2 volumes). Edited by Carl Murchison and an international cooperating board. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

Psychological Review—Princeton, N. J.: Psychological Review Company. Subscription $5.00. 540 pages annually. Bi-monthly. General Psychology. Edited by Herbert S. Langfeld. Founded 1894.

Psychological Monograph—Princeton, N. J.: Psychological Review Company. Subscription $6.00 per vol. 500 pp. Ed. by Joseph Peterson. Published without fixed dates, each issue one or more researches. Founded 1895.

Psychological Index—Princeton, N. J.: Psychological Review Company. Subscription $4.00. 300–400 pp. Edited by W. S. Hunter and R. R. Willoughby. An annual bibliography of psychological literature. Founded 1895.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company. Subscription $6.00. 720 pages annually. Psychological literature. Monthly (10 numbers). Edited by John A. McGeoch. Founded 1904.

Archives of Psychology—New York: Columbia University. Subscription $6.00. 500 pp. ann. Ed. by R. S. Woodworth. Published without fixed dates, each number a single experimental study. Founded 1906.

Journal of Abnormal and Social Psychology—Eno Hall, Princeton, N. J. American Psychological Association. Subscription $5.00. Foreign, $5.25. Editor, Harry T. Moore. Quarterly. 448 pages annually. Abnormal and Social. Founded 1906.

Psychological Clinic—Philadelphia: Psychological Clinic Press. Subscription $3.00. 288 pages. Ed. by Lightner Witmer. Without fixed dates (Quarterly). Orthogenics, psychology, hygiene. Founded 1907.

Psychoanalytic Review—Washington, D. C.: 3617 10th St., N.W. Subscription $6.00. 500 pages annually. Psychoanalysis. Quarterly. Ed. by W. A. White and S. E. Jelliffe. Founded. 1913.

Journal of Experimental Psychology—Princeton, N. J. Psychological Review Company. 900 pages annually. Experimental. Subscription $7.00. Bi-monthly. Edited by S. W. Fernberger. Founded 1916.

Journal of Applied Psychology—Lancaster, Pa.: Science Press Printing Co. Subscription $6.00. 600 pages annually. Bi-monthly. Edited by James P. Porter, Ohio University, Athens, Ohio. Founded 1917.

Journal of Comparative Psychology—Baltimore: The Williams & Wilkins Co. Subscription $5.00 per volume of 450 pages. Two volumes every year. Edited by Knight Dunlap and Robert M. Yerkes. Founded 1921.

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